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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1991

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES UNITED STATES SENATE

ONE HUNDRED FIRST CONGRESS

SECOND SESSION

ON

S. 2884

AUTHORIZING APPROPRIATIONS FOR FISCAL YEAR 1991 FOR MILITARY ACTIVITIES OF THE DEPARTMENT OF DEFENSE, FOR MILITARY CONSTRUCTION, AND FOR DEFENSE ACTIVITIES OF THE DEPARTMENT OF ENERGY, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR FOR THE ARMED FORCES AND FOR OTHER PURPOSES

PART 4

PROJECTION FORCES AND REGIONAL DEFENSE

MAY 22; JUNE 12, 19 1990

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1991

TUESDAY, MAY 22, 1990

U.S. SENATE,
SUBCOMMITTEE ON PROJECTION FORCES
AND REGIONAL DEFENSE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

NAVY SHIPBUILDING AND CONVERSION PROGRAM

The subcommittee met, pursuant to notice, at 9:35 a.m., in room SR-222, Russell Senate Office Building, Senator Edward M. Kennedy, (chairman of the subcommittee) presiding.

Committee members present: Senators Kennedy, Exon, Dixon, Warner, Cohen, McCain, Gorton and Lott.

Professional staff members present: Richard D. Finn, Jr., Creighton Greene and John J. Hamre.

Minority staff members present: Patrick A. Tucker, minority staff director and counsel; George W. Lauffer and Mark B. Robinson, professional staff members.

Staff assistants present: Elizabeth Ann Harlow, Lori M. Jackson, Claire M. Kelly, Lisa H. Kettlewell and Melissa A. Ramsey.

Committee members' assistants present: Andrew J. Johnson, assistant to Senator Exon; William J. Lynn, assistant to Senator Kennedy; Charles C. Smith, assistant to Senator Dixon; Milton D. Beach, assistant to Senator Glenn; Leon S. Fuerth, assistant to Senator Gore; Dale F. Gerry, assistant to Senator Cohen; Patrick F. McCartan, assistant to Senator Wilson; Robert M. Soofer, assistant to Senator Gorton; and Charles G. Pearcy, assistant to Senator Lott.

OPENING STATEMENT OF SENATOR EDWARD M. KENNEDY, CHAIRMAN

Senator KENNEDY. We will come to order. The subcommittee meets here this morning to consider the Navy Shipbuilding and Conversion Program. It is timely that we consider where the Navy is headed in this era of changed threats and circumstances. There is no longer any threat to Western Europe from the Warsaw Pact nations of Eastern Europe and the Soviet threat itself is substantially diminished.

Nevertheless, the world remains a dangerous place. There are numerous areas where regional instability could affect our vital interests. One of the most significant risks is the proliferation of sophisticated weapons among the countries of the Third World. Even though our Armed Forces may not be faced with the threat from front-line Soviet forces, they could very well face front-line Soviet weapons.

It is clear that we can and must meet these potential threats with fewer resources devoted to defense. The military threat no longer justifies the record spending of the 1980s, and the domestic programs that were pushed aside in that period must now be increased.

With respect to the Navy, the change in the national circumstances and the expected reduction of the defense budget requires us to review all aspects of the shipbuilding program. In fiscal year 1991 alone, the Navy had requested $11 billion for shipbuilding, almost three times the size of the Star Wars budget.

Our review must be conducted in several levels. First, at the broadest level we must assess how large a fleet we need to protect our vital interest as a maritime power. Clearly, we are no longer talking about a 600-ship Navy. The plans currently under review in the Pentagon will reduce the fleet from its present 551 ships to 488 ships in 1997.

The Congressional Budget Office will testify about whether even this number of ships can be maintained in likely budget scenarios. This testimony provides the framework for the subcommittee to examine the 1991 Shipbuilding Program.

Second, the subcommittee also must review the relative proportions of surface vessels and submarines in the Shipbuilding Program. Here, too, the most important factor is the substantial reduction of the likelihood of a major U.S.-Soviet conflict. A force oriented toward more limited, low intensity conflicts would rely more heavily on aircraft carrier battle groups, amphibious ships and deemphasize submarine and anti-submarine forces which are oriented toward a larger East-West conflict. Even in the latter areas, however, it is crucial that we maintain our technological edge.

Third, the subcommittee will examine the schedule, cost, and performance of the major shipbuilding programs. In particular we will address the question of concurrency, the practice of beginning production before development is complete. Shipbuilding programs are unique because it takes 5 to 7 years to complete a ship or submarine. We cannot build and test a prototype before going into production; but we should not begin production on follow-on versions until we know that the prototype works.

In this context we are aided by the reduction in the Soviet threat. The need to deploy our new systems quickly have been reduced, allowing us to ensure that the new systems perform as planned before deployment.

At today's hearing the General Accounting Office will testify about concurrency in the Navy's two major shipbuilding programs, the SSN-21, nuclear attack submarine, and the DDG-51, the Aegis destroyer.

Before we turn to our witnesses, I would like to ask Senator Cohen if he has an opening statement.

Senator COHEN. Mr. Chairman, I have no opening statement to make. I have a lot of questions that I am going to be asking today, so I would like to reserve any time that I have for later.

Senator **KENNEDY**. Fine. We will take that into consideration. Senator Exon.

Senator **EXON**. Mr. Chairman, thank you very much.

Mr. Chairman, we have a markup at 10 a.m. in the Commerce Committee. I will have to leave to go over there; and I will come back to this hearing as quickly as I can.

I think this is a tremendously important hearing as this committee continues to discuss where and how we get the money to carry on the various priority programs that we have. Therefore, this is a particularly important hearing with regard to what the priorities are to be recommended by the U.S. Navy.

I would like to echo the comments made in the opening statement by the Chairman. The Navy is an integral part of our overall national security now, and even more so in the future given the continued threat for low-intensity conflicts around the world where the Navy has always played a very predominant role, especially during this Cold War period. We are going to have to call upon the Navy to make some additional reductions that, thus far, the Navy has consistently resisted. I just speak for one member of this subcommittee in saying that we want you to be very realistic with us, because there is no way that we are going to be able to meet the Navy goals on the chart that I see in front of us. Therein lies the dilemma that we have here. We want to work closely with you, but there will be some questions today that I think will be basically directed at how we get from this point to that point at a significant reduction in the amount of funds that we are spending for all of our military? The Navy cannot and must not be an exception.

Thank you, Mr. Chairman.

Senator **KENNEDY**. Thank you very much, Senator Exon. The first witness is Mr. Robert Hale, Assistant Director for the National Security Division, Congressional Budget Office.

Mr. Hale, I look forward to your testimony.

Our second witness from the General Accounting Office, Martin Ferber, GAO's Director of Navy Issues.

Then we will hear from the Navy.

Without objection I will insert into the record a statement by Senator Dixon regarding this hearing.

[The statement referred to follows:]

PREPARED STATEMENT OF SENATOR ALAN J. DIXON

Mr. Chairman, it is a pleasure to have with us today two panels of distinguished witnesses from the Congressional Budget Office, the General Accounting Office, and the U.S. Navy. I understand that the subcommittee will hear testimony on the Navy's shipbuilding program.

It is clear that the dramatic changes we are witnessing in the Soviet Union and Eastern Europe, as well as the shrinking defense budget, affect all aspects of our military planning. Essentially, we must re-examine and rethink fundamental U.S. defense strategy and defense policy. I do not believe that any of our military services should be exempt from the reductions that are going to have to take place now and in the future. The Navy will obviously be part of the general contraction of our armed services that will inevitably occur.

Although the Navy is going to face reductions, I also believe that force projection continues to be a critical component of our Nation's defense policy. In fact, its importance might even increase in the new threat environment that is emerging. The challenge we face is how to guarantee that the United States has sufficient force projection capabilities, given a changing world and the declining defense budget.

In terms of Navy shipbuilding, we must ask ourselves if a reorientation of priorities is necessary. For example, as we reduce troops deployed overseas—while still facing threats to our interests around the world—it becomes even more necessary to be able to move appropriate forces to potential trouble spots. I'm not sure that we can now safely say that we possess the necessary capabilities. Perhaps it is time to begin devoting more attention to areas such as amphibious shipping and strategic sealift. I believe that this hearing provides a good opportunity to begin the process of examining our future shipping needs.

Mr. Chairman, I look forward to hearing from today's witnesses.

STATEMENT OF ROBERT F. HALE, ASSISTANT DIRECTOR, NATIONAL SECURITY DIVISION, CONGRESSIONAL BUDGET OFFICE; ACCOMPANIED BY MICHAEL BERGER, NAVY ANALYST, NATIONAL SECURITY DIVISION, CONGRESSIONAL BUDGET OFFICE

Mr. HALE. Thank you, Mr. Chairman. I appreciate the chance to testify today about trends in the Navy's shipbuilding budget. I will submit my prepared statement for the record and give you an oral summary. I have with me Mr. Michael Berger from my office who prepared this analysis.

Ships take years to build and spend decades in the fleet; so analyzing shipbuilding budgets demands a long-term perspective. My testimony today will focus on shipbuilding budgets over the next decade, but I will discuss how those budgets will affect the Navy's fleet through the year 2020. Today I will focus on the shipbuilding and conversion or SCN account, though the analysis that CBO is doing for the subcommittee will eventually cover the entire Navy budget.

I will turn first this morning to the Navy's publicly stated goals for ships and estimate how much SCN funding would have to increase if those goals are to be met. And then I will discuss the effects of reduced SCN funding on the Navy fleet in the next century.

The Navy has publicly specified goals for different types of ships that, taken together, add up to a fleet of about 585 vessels. This goal has not changed much since the 1980s, when the Navy said it needed 600 ships. According to the Navy, those 585 ships should include 14 deployable aircraft carriers, 120 cruisers and destroyers, 100 attack submarines, and other types of ships.

Now, press reports have suggested that the Navy, in its most recent Program Objectives Memorandum or POM, has proposed a plan that calls for a smaller fleet of 488 ships by 1997, including 12 aircraft carriers. Later in my testimony, I will describe the budgetary effects of a program similar to the one described in those press reports. CBO does not, however, have the details of the Navy POM; those details are classified. And the plan could be changed before it is formally submitted to the Congress. So, I will focus initially on the current, publicly stated goals.

I also note that Navy officials continue to argue that, despite budgetary limitations, they need a fleet larger than 488 ships and one that has 14 aircraft carriers. You may hear those sentiments again later this morning. So, I think the cost of meeting these publicly stated goals remains of budgetary interest.

CBO estimates that, between 1991 and the year 2000, real or inflation-adjusted SCN would have to increase by an average of 5 percent a year if the Navy is to move toward meeting its goal for 585 ships. You can see that figure, if your eyes are good, on the top line of that table over here to my right. If you are interested, the same table appears in my prepared statement. The table also shows how many ships the Navy would buy in various periods of time and how large the fleet would be.

The annual SCN increase of 5 percent required to meet the Navy's goals is large for several reasons. The Navy would have to buy a number of aircraft carriers during this period and would also have to buy a large number of attack submarines and carrier escorts. The estimates that CBO has given you are intentionally based on conservative assumptions. For example, CBO has assumed no growth in the unit costs of ships. When I say conservative, I mean that if these assumptions change, they are likely to change in ways that would increase that estimate of 5 percent.

But what happens if SCN funds do not grow? The SCN budget may not be cut as much as other parts of the defense budget, but it is not likely to grow either. To illustrate the effects on the fleet of constant or reduced funding, I will turn now to an analysis of three different cases. Under these cases, the SCN account between 1991 and the year 2000 receives either no real growth in funding, cuts of 2 percent a year or cuts of 4 percent a year. Reductions are not assumed to continue beyond the year 2000, and, initially, all three of these cases assume that reductions in funding are imposed proportionately on each major type of ship—carriers, carrier-escorts, and so forth.

Since it takes many years before SCN cutbacks result in fewer deployed vessels, one important finding is that none of these three cases would quickly reduce the size of the Navy's fleet. If you look at the chart over to my left, those lower three lines trail off rather gradually, starting on that chart with 1990 and going out through the year 2000, eventually 2020. In the year 2000, the fleet would be near its current size under all these cases, ranging from about 538 ships to 555 ships. This gradual reduction might suggest that, in principle, the United States could reduce SCN funding during the 1990s and then, if threats to U.S. security worsen, the country could reverse course and build up in the next century.

But reversing course might be more difficult than it appears because the cutbacks could significantly reduce the size of the shipbuilding industry. For example, if the United States had 4 percent annual real declines in the SCN budget, the Navy would be buying in the 1990s an average of 10.9 new ships a year. That compares with about 17.6 ships bought during an average year in the 1980s. Because the Navy would be buying many fewer ships, the United States would have a smaller shipbuilding industry and it might be difficult to reverse course quickly.

In contrast to the year 2000, by the year 2020 the effects of reduced SCN funding are much more pronounced. That is clear, again, if you look at the chart, this time all the way over to the right-hand side. The lower three lines, the green, orange, and purple ones, show what happens in the year 2020. By that year, the number of vessels in the fleet would range from 390 ships, assuming an annual budgetary decline of 4 percent—that is the purple line—up to 487 ships, assuming no real growth or decline in SCN funding—that is the green line. If there were proportional cuts in funding for each type of ship, the Navy would have fewer of each type. For example, it might have as few as nine aircraft carriers with 4 percent annual budgetary declines. If you are interested in the details of numbers of type or ship, they are on page 18 of my prepared statement.

The smaller fleets of the year 2020 might be more capable than these numbers alone suggest because the fleets would have many newer, more technologically sophisticated vessels. But on the other hand, the figures on this chart may overestimate the number of ships the Navy would have in the fleet under these funding levels because CBO has assumed no growth in the unit costs of ships. If, for example, the unit cost of all new ships grew at 2 percent a year in real terms, and that is not unreasonable in the light of recent history, then the fleet of the year 2020 would number only 340 ships if there were 4 percent annual declines in total SCN funding. That compares with 390 if there were 4 percent declines but no growth in the unit cost of ships.

This green line on my chart may also tell you something about the long-run costs of the Navy's POM plan, at least as reported in the press. As I mentioned earlier, those press reports suggest that the Navy now plans for 488 ships and 12 aircraft carriers. CBO's analysis shows that, in the long run, a fleet of 488 ships, including 12 carriers, would require that the SCN budget, on average, stays constant in real terms. This assumes that the Navy scales down the fleet but keeps the mix of ships roughly at today's levels.

So this POM plan, as reported in the press, would probably not require real increases in SCN funding over the long run, but it would also not permit any reductions in SCN funding in real terms.

Whether it has 488 ships or fewer than 400, the Navy fleet of the next century will probably be smaller. That means that the Navy may have to reconsider the priority of some of its missions. The Navy could, of course, reduce the capability to perform each of its missions proportionately. Alternatively, the service might protect some of its missions and cut others by relatively larger amounts.

To illustrate the effect of a change in priorities, CBO assumed that the Navy imposes smaller budgetary cuts on two of its major missions—that is, strategic deterrence and power projection—and accepts larger cuts in a third mission—that is sea control. This approach would involve no cuts in funding for ballistic missile submarines and relatively smaller cuts in aircraft carriers and other ships involved primarily in power projection. But attack submarines and other ships involved primarily in sea control would be cut more sharply under what is, I emphasize, an illustrative case.

Emphasis on particular missions would not have much effect on the total size of the Navy, though it would have a lot of effect on the composition of the fleet. For example, with this emphasis on power projection, the Navy could come close to meeting its goal for 14 carriers, even if it had 4 percent annual real declines in the SCN funding. But protecting power projection ships would lead to sharp cuts in attack submarines. So, if it had 4 percent decline and protected power projection, the Navy would end up with a fleet in

2020 of about 34 attack submarines, roughly one-third of what the Navy has today.

I think this result and others like it suggest that Navy planners and other military planners are going to face a difficult problem in the next few years. If budget cuts are deep and these planners are asked to rearrange priorities to favor one mission over another, then the Navy will end up drastically reducing the forces of the less-favored mission. It does not mean that it ought not to be done, but it does mean that it may nearly wipe out some of these less-favored missions.

In conclusion, Mr. Chairman, SCN budgets could decline in future years and if they do, the Navy could end up with a fleet much smaller than its goals for 585 ships and even smaller than its reported current goal of 488 ships. For example, as I have said, if the SCN budget declines at 4 percent a year in real terms, the Navy could have a fleet of 390 ships in the year 2020, even fewer if there are cost increases in the unit cost of ships. Such a decline may require the Navy to reconsider the priority of its missions, emphasizing one or more over others.

It is not too soon to begin that reconsideration. The sooner the process begins the more time will be available to make the difficult but important decisions about the kind of fleet the Navy is going to be operating in the 21st century.

That concludes my oral remarks, Mr. Chairman. Mr. Berger and I will be glad to answer any questions.

[The prepared statement of Mr. Hale follows:]

Statement of
Robert F. Hale
Assistant Director
National Security Division
Congressional Budget Office

I appreciate the chance to testify before this Subcommittee about trends in the Navy's shipbuilding budgets. Ships take years to build and spend decades in the fleet. Thus, analyzing shipbuilding budgets demands a long-term perspective. My testimony today will focus on shipbuilding budgets over the next decade and discuss how those budgets will affect the Navy fleet through the year 2020.

KEY FINDINGS

My testimony suggests three main conclusions:

- The Navy's publicly stated goals for numbers and types of ships would require real increases in shipbuilding funds of about 5 percent a year through the end of this decade;

- If, instead, shipbuilding budgets decline along with the rest of the defense budget, then the Navy of 2020 will be much smaller--perhaps only two-thirds of its current size or even less--and its missions will have to be reconsidered;

- For example, emphasis on the Navy's power projection mission--which would result in relatively larger purchases of aircraft carriers and other ships--could lead to sharp declines in numbers of attack submarines and other ships intended primarily for the sea control mission.

The Congressional Budget Office (CBO) based these conclusions on assumptions about how much ships will cost, when ships will retire, and other factors that may well change between now and 2020. In an effort to be conservative, we selected assumptions that tend to increase the size of the fleet. Thus, most changes in the assumptions in this testimony--for example, increases in the unit cost of new ships or early retirement of some ships--would result in smaller fleets than those I will discuss.

My testimony today will focus only on the Navy's shipbuilding budget--that is, the Navy Shipbuilding and Conversion (SCN) account. CBO is currently analyzing Navy budgets, and particularly the SCN budget, at the request of this Subcommittee. The next phase of CBO's analysis will consider the effects of alternative shipbuilding plans on the entire Navy budget, which includes funding for aircraft as well as funds to operate the Navy's ships and aircraft.

NAVY SHIP GOALS

The Navy has publicly specified goals for different types of ships that taken together result in a fleet of about 585 ships (see Table 1). This objective is slightly larger than the existing fleet, which will number 547 ships at the end of 1990. According to the Navy, the 585 ships should include 14 deployable aircraft carriers, 120 cruisers and destroyers, 100 attack submarines, as well as many ships of other types.

Recent press reports suggested that, in its most recent Program Objectives Memoranda (POM), the Navy has proposed a plan for fiscal years 1992-1997 that calls for a smaller fleet of 488 ships by 1997, including 12 aircraft carriers. Later in this testimony, I will describe the budgetary effects of a program similar to the one described in the press reports. CBO does not, however, have the details of the Navy's new POM plan, which are classified. Moreover, the plan could be changed before it is formally submitted to the Congress. Therefore, I will focus initially on the current, publicly stated goal and its associated cost. Among other things, this discussion will make it clear why the Navy was under such pressure to reduce its goal for ships.

The Navy's fleet carries out three major missions. A small but important part of the Navy consists of submarines that are designed to help deter nuclear war by carrying strategic nuclear missiles. Most Navy ships would be used in a conventional or nonnuclear war, where they would perform either or both of two major missions: attacking land-based targets from the sea (the power projection mission) or controlling the seas in order to protect friendly shipping (the sea control mission).

In peacetime, the Navy deploys ships around the globe in order to enhance regional stability and "show the flag." Navy officials maintain that a fleet that meets the goals is required to carry out these wartime and peacetime missions while ensuring that sailors do not spend too much time away from their families during routine, peacetime deployments.

TABLE 1. GOALS FOR THE SIZE OF THE NAVY FLEET COMPARED WITH FLEET SIZE IN 1990

Type of Ship	Current Navy Goals	Navy Goals in January 1987	1990 Fleet (Year end)
Ballistic Missile Submarines	24	20 to 40	34
Attack Submarines	100	100	90
Deployable Aircraft Carriers	14	15	14
Battleships	2	4	4
Carrier Escorts[a]	120	137	100
Frigates[b]	104	101	99
Other[c]	221	220 to 225	206
Total	585	600[d]	547

SOURCE: Congressional Budget Office based on Department of Defense data.

a. Cruisers, destroyers, and ships referred to as battle force capable (BFC) ships in the Surface Combatant Force Requirements Study.

b. Frigates and ships referred to as protection of shipping (POS) ships in the Surface Combatant Force Requirements Study.

c. Mine warfare, amphibious warfare, combat logistics, patrol, and support ships. The goals for these vessels may vary slightly but total approximately 221 ships.

d. This total reflects the numbers toward the lower end of the ranges for specific types of ships.

Today's Goal Compared with Those of Recent Years

The goal of about 585 ships is only slightly smaller than the goal established a few years ago. Table 1 shows the Navy goal as of January 1987. At that time, the Navy felt it needed 600 ships. The reduction to about 585 ships reflects changes in several classes of ships.

Aircraft Carriers. In its budget plan submitted last year, the Navy reduced its goal for deployable aircraft carriers from 15 to 14. The size of the carrier force is important because it influences requirements for carrier escort ships (cruisers and destroyers), logistics ships that replenish carriers at sea, and carrier-based aircraft. Throughout this testimony, CBO assumes that the Navy will continue its current practice of requiring one aircraft carrier beyond the number considered to be deployable.

Carrier Escorts and Frigates. The goals for carrier escorts (cruisers and destroyers) and for frigates--smaller ships that the Navy expects will escort convoys in time of war--have also declined modestly in recent years. In 1988, the Navy endorsed the recommendations of the Surface Combatant Force Requirements Study (SCFRS). This study recommended lowering the goal for carrier escorts and frigates from 238 ships to 224.

Ballistic Missile Submarines. Previous Navy plans indicated that the Navy's goal was between 20 and 40 ballistic missile submarines, but the Navy now says that it needs 24 such vessels. These submarines carry missiles armed with strategic nuclear warheads. The Assistant Chief of Naval Operations for Undersea Warfare recently stated that this goal of 24 ballistic missile submarines is consistent with the U.S. negotiating position in the Strategic Arms Reduction Talks (START).

START does not limit the number of missile submarines, but it does limit the total number of all types of strategic missiles and warheads. Hence, force levels for strategic submarines could be altered, depending on how the

United States allocates the total allowed number of missiles and warheads among land-based missiles, bombers, and submarines. They could also be altered by a follow-on to the proposed START treaty, which could further limit missiles and warheads.

Future Goals Could Change

While the Navy's goal for ships has not changed much in recent years, almost everything else has. Dramatic changes in Eastern Europe and the Soviet Union have made obsolete many of the assumptions that guided defense planning in the past. In order to hold down its operating budget, the Navy's budget for 1991 announced plans to retire ships early--including two battleships, five nuclear-powered attack submarines, and two nuclear-powered cruisers. Secretary of Defense Cheney recently ordered a special review of two major shipbuilding programs (the DDG-51 guided missile destroyer and the SSN-21 attack submarine). Similar reviews of aircraft programs produced some sharp reductions in planned purchases.

Senior officials have also suggested changes in the Navy's goal for ships. In a recent speech, Senator Nunn suggested that the Navy could accomplish necessary missions with 10 to 12 aircraft carriers. Secretary of Defense Cheney also raised the possibility of fewer carriers in recent testimony, but provided no firm number. As I mentioned earlier in this testimony, press reports indicate that the Navy itself has proposed a reduction in the size of the fleet.

Nevertheless, Navy officials have argued quite recently that the changes in Eastern Europe and the Soviet Union should not significantly affect the size of the Navy. Press reports indicate that, while proposing a smaller fleet of 488 ships to accommodate budgetary limits, these officials argued that the Navy still needs a larger fleet with 14 aircraft carriers. Therefore, the cost of meeting the Navy's goals of 14 aircraft carriers and about 585 ships may still be of budgetary interest.

COST OF MEETING NAVY GOALS

CBO estimates that, between 1991 and the year 2000, real or inflation-adjusted SCN funding would have to increase by an average of 5 percent a year if the Navy is to move toward meeting its goal for about 585 ships (see Table 2).[1] Funding during the period would average $15.3 billion, compared with $11.4 billion in 1990 and $13.0 billion in the 1981-1990 period--years generally considered favorable for funding naval shipbuilding. (All costs in this testimony are expressed in fiscal year 1991 dollars of budget authority.) The Navy would purchase an average of 17.1 ships each year between 1991 and 2000 (see Table 2 and Table A-1 in Appendix A of this testimony).

Annual increases would average 5 percent in the 1990s but would range widely in particular years, depending on the number and types of ships being purchased in that year. Annual funding would range between $11.0

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[1] The calculation of 5 percent annual real growth assumes that the shipbuilding and conversion (SCN) appropriation for 1990 does not include funds for procuring fast sealift ships. The Congress appropriated, but did not authorize, about $600 million for fast sealift ships for 1990. Final resolution of this issue awaits Congressional action.

TABLE 2. SELECTED EFFECTS OF ALTERNATIVE SHIPBUILDING BUDGETS

	Average Annual Real Growth in Funding (Percent)		Average Number of Ships Purchased Per Year		Number of Ships in the Fleet	
	1990-2000	2001-2020	1990-2000	2001-2020	2000	2020
Meets Navy Goals	5	2	17.1	15.8	571	559
No Real Growth	0	0	13.5	12.9	555	487
Two Percent Annual Decline	-2	0	11.8	10.6	545	438
Four Percent Annual Decline	-4	0	10.9	8.5	538	390

SOURCE: Congressional Budget Office

billion and $19.4 billion.

Even with these substantial funding increases, goals for some types of ships would not be met by the year 2000. To meet the goal for each type of ship, and to sustain the fleet at the desired level, funding increases would be needed in the years beyond 2000, though at a much lower rate than those required in the 1990s. Over the 2001-2020 period, increases would average only about 2 percent a year. With these increases, the Navy could meet its goals for every type of ship--except frigates and other convoy escorts--by the year 2010 and sustain the fleet at the desired level.[2]

These estimates of increased funding are based on a number of assumptions. Ships are assumed to be retired at the end of an average service life, which varies by type of ship. If a particular type of ship has a shortfall, CBO assumes the Navy would meet it gradually by continuing to buy that type of ship at today's rates or rates planned by the Navy; if no shortfall occurs, CBO assumes enough ships would be bought to avoid creating one. CBO also assumes that costs for smaller support ships, and for overhauls and conversions, remain constant as a share of the cost of major ships. These assumptions are discussed in more detail in Appendix B of this testimony.

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[2] The Navy does not reach its goal for frigates and other convoy escorts until after 2020. The Navy does not plan to buy new frigates in the future. Rather, it plans on using older (20 years and older) carrier escorts for convoy escort missions. The Navy acknowledges a shortfall of these types of ships, and CBO did not attempt to meet this shortfall. Buying new ships to meet the shortfall of convoy escorts would further increase the costs of meeting the Navy's goals.

Reasons for High Growth in the 1990s

There are several reasons why large increases in SCN funding are needed over the next decade if the Navy is to move toward meeting its goals for ships. In part, the high rate reflects the need to buy new aircraft carriers. To maintain a fleet of 14 deployable carriers, while retiring carriers at the end of their assumed service life of 45 years, the Navy will have to buy five new carriers between now and the year 2000. At today's prices, each would cost about $3.5 billion.

The Navy will also have to buy many other types of ships in order to meet its goals. Indeed, the cost of aircraft carriers in the 1991-2000 period represents a relatively small share of funding for major ships--about 13 percent (see Table A-2). But the number of carriers influences the goal for carrier escorts, which would have to be purchased in substantial numbers in the 1990s if the goal is to be met. The Navy would also have to purchase substantial numbers of new attack submarines in the 1990s. Attack submarines and carrier escorts consume approximately two-thirds of funds for major ships.

Effects of Increases in Unit Costs

The rate of growth in SCN funding could be even higher than suggested by these estimates if the unit cost of new ships grows substantially. In its basic estimates, CBO assumes that unit costs for each type of ship remain constant in real terms through the year 2020. History, however, suggests that costs per ship will rise, at least for some types of ships. For example, each of the DDG-51 class of guided missile destroyers now under construction costs about two and one-half times as much to build, even after adjusting for inflation, as did each ship of the DDG-2 class that they will replace. On average, that suggests real growth in cost per ship of about 3 percent a year. A similar calculation for attack submarines results in annual real cost growth of about 4 percent. Some of these cost increases reflect improvements in capability. Cost growth in the future could also reflect lower rates of ship procurement.

Not all types of ships are likely to grow sharply in cost, but some probably will. To illustrate the effects of growth in unit costs, assume that the unit cost for all types of ships rises at an average rate of 2 percent a year. Then SCN funding would have to increase at an average rate of 7 percent a year between 1991 and 2000 instead of 5 percent. Between 2001 and 2020, SCN costs would grow at 4 percent a year instead of 2 percent.

EFFECTS OF REDUCED FUNDING

The Secretary of Defense has called for reducing the total defense budget by 2 percent a year. Some Members of the Congress have called for even larger reductions--4 percent a year or more. A reduction in the threats facing naval forces is less clear than is the case for some other military forces. Thus, SCN funding possibly will not be subject to cuts as large as those imposed on the overall budget. Nevertheless, as recent press reports confirm, the SCN account is not likely to be exempt from all the budgetary cuts; it is even less likely to grow at the annual real rate of 5 percent or more required to move toward the Navy goal for ships.

To illustrate the effects on the fleet of constant or reduced funding, this testimony examines three cases that vary in the amount of SCN funds assumed to be available. Under these cases, the SCN account between 1991 and the year 2000 receives:

- No real growth;
- Real reductions of 2 percent a year; or
- Real reductions of 4 percent a year.

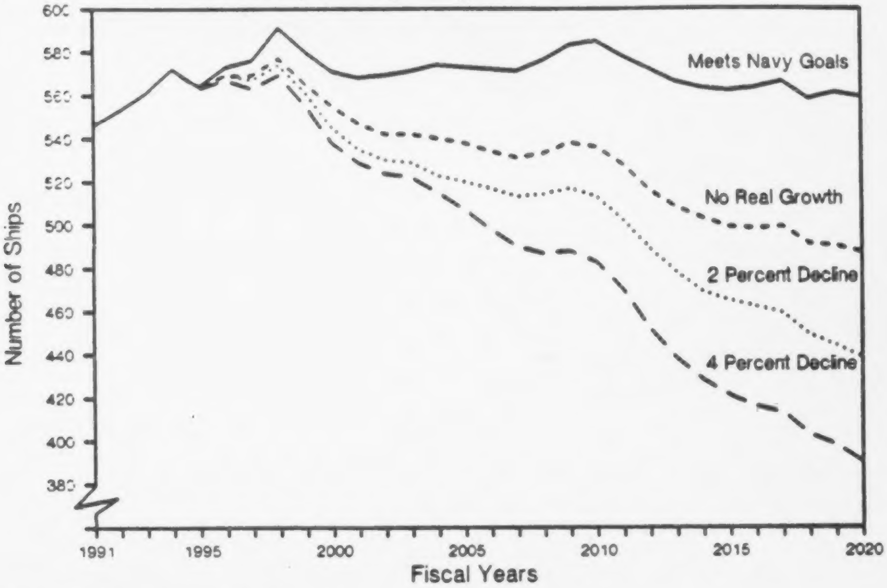
Beyond the year 2000, funding is assumed to remain constant in real terms under all three cases. Initially, all three cases assume that reductions in funding are imposed proportionally on each major type of ship (that is, aircraft carriers, ballistic missile submarines, carrier escorts, and so forth).

Effects on Fleet Size in the Year 2000

Since it takes many years before funding cutbacks result in fewer deployed vessels, none of the three cases would quickly reduce the size of the Navy's fleet. In the year 2000, the number of ships in the Navy would range from 538, assuming annual decline of 4 percent, to 555 ships, assuming no real growth or decline (see Figure 1). This number compares with 547 ships in the fleet today.

A gradual reduction in fleet size would suggest that--in principle--the United States could reduce SCN funding during the 1990s; then, if threats to U.S. security worsen, the country could reverse course and build up in the next century. It could accomplish such a reversal by a combination of

Figure 1. Numbers of Ships in the Navy Fleet Under Alternative Shipbuilding Budgets



SOURCE: Congressional Budget Office.

NOTE: Assumes funding declines through 2000 and is level from 2001 through 2020.

increases in SCN funding in the next century and delays in retiring selected ships.

Reversing course might be more difficult than it appears, however, because of the effects of cutbacks on the U.S. shipbuilding industry. Reductions in SCN funding would alter ship purchases more quickly than the reductions would cut fleet size. Between 1991 and 2000, the average number of ships purchased would vary from 13.5 with no real growth in SCN funding, to 10.9 if funding declines by 4 percent a year (see Table 2). This amount compares with annual purchases of 17.6 ships between 1981 and 1990.

Cutbacks in ship procurement would hurt the U.S. shipbuilding industry, which relies almost exclusively on Navy shipbuilding contracts. (Only one large commercial vessel is currently on order in U.S. shipyards.) Some yards might well go out of business. With fewer shipyards, the United States would have less capability to increase ship production quickly in the event of a change in threats to U.S. security. This outcome would not preclude a reversal of the Navy's fleet size, but it would delay any such change.

Effects on Fleet Size in 2020

By the year 2020, the effects of alternative SCN funding on fleet size would be more pronounced.[3] By this time, the lower levels of funding would have been in effect for many years and would have had time to affect the size of the fleet significantly. The number of vessels would range from 390 ships, assuming an annual budgetary decline of 4 percent, to 487 ships, assuming no real growth or decline. This amount represents 11 percent to 29 percent less than the 547 ships now in the fleet.

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[3] This testimony analyzes the procurement of ships and the size of the fleet through the year 2020. Because they take many years to build, aircraft carriers procured after 2012, submarines procured after 2015, and surface ships procured after 2016 would enter the fleet after 2020.

Each major type of ship would also be reduced in number by the year 2020. Assuming proportional cuts in each type of ship, the Navy would have as few as 9 aircraft carriers, with 4 percent annual budgetary decline, or as many as 12 carriers, if budgets remain constant in real terms (see Table 3). Attack submarines would range from 66 to 82. Other types of ships would also be reduced.

The smaller fleets of the year 2020 would be more capable than their numbers alone indicate. These smaller fleets would be made up of more modern ships that tend to be more effective than the vessels that they replace. According to the Navy, several newer types of ships--including the DDG-51 class of guided missile destroyers, the SSN-21 class of submarines, and the Wasp class of amphibious assault ships--carry more weapons and better sensors and electronics than the ships they replace.

Alternatively, the numbers of ships in Figure 1 may overestimate the size of fleet that would be available under various levels of funding. The estimates in Figure 1 assume no growth in cost per ship. But, as I noted earlier, history suggests that unit costs of some types of ships would grow, particularly as lower levels of funding lead to lower rates of production. This effect could be significant. For example, if the cost per ship for all types of ships grows by 2 percent a year, then by the year 2020 the Navy would have

TABLE 3. SIZE OF THE FLEET UNDER DIFFERENT FUNDING LEVELS IN 2020 ASSUMING EQUAL PERCENTAGE REDUCTIONS

Type of Ship	No Real Growth	2 Percent Real Decline	4 Percent Real Decline
Ballistic Missile Submarines	21	21	18
Attack Submarines	82	77	66
Deployable Aircraft Carriers	12	11	9
Battleships	0	0	0
Carrier Escorts[a]	99	83	67
Frigates[b]	62	62	60
Other[c]	211	184	170
Total	487	438	390

SOURCE: Congressional Budget Office.

a. Cruisers, destroyers, and ships referred to as battle force capable (BFC) ships in the Surface Combatant Force Requirements Study.

b. Frigates and ships referred to as protection of shipping (POS) ships in the Surface Combatant Force Requirements Study.

c. Mine warfare, amphibious warfare, combat logistics, patrol, and support ships.

a fleet of only about 340 ships, assuming 4 percent annual declines in funding, compared with about 390 ships if costs per ship do not grow.

Budgetary Effects of the New Navy Plan

As I mentioned earlier in this testimony, press reports suggest that the Navy now plans on a fleet of 488 ships by 1997, including 12 aircraft carriers. CBO's analysis suggests that, in the long run, a fleet of 488 ships including 12 carriers would require an SCN budget that, on average, stays constant at today's level in real terms. This finding assumes that the Navy reduces the size of the fleet but does not substantially alter the mix of types of ships. A constant budget would not, however, lead to a fleet of 488 ships by 1997 because smaller shipbuilding budgets do not have much effect on fleet size for many years. Instead, the reduction in the size of the fleet between now and 1997 would be accomplished primarily through early retirements of older ships.

THE NEED TO RECONSIDER MISSIONS

The potential for a sharply smaller fleet in the next century suggests a need to reconsider Navy missions. If it has fewer ships, the Navy could reduce its capability to perform each of its missions proportionately. That might mean proportional reductions in submarines that provide strategic deterrence, ships that provide power projection by attacking targets on land, and ships that provide sea control.

Alternatively, the Navy might consider protecting some missions against deep cuts while accepting relatively larger reductions in others. To illustrate the effects of such a decision, CBO assessed the effects of imposing smaller cuts in two missions--strategic deterrence and power projection.

While illustrative, such a choice might be consistent with the philosophies of many military planners. Many of them assign high priority to strategic submarines; because they are so difficult to detect and destroy, they help deter a nuclear attack by ensuring the ability of the United States to retaliate. Naval forces that provide power projection may be particularly useful in smaller wars, which today seem more likely than a major conflict pitting U.S. forces against those of the Soviet Union.

Specifically, in this illustration, CBO assumes that the Navy provides all funds necessary to meet its goal of having 24 submarines capable of launching strategic missiles. Funding for forces designed primarily for projecting power is assumed to be reduced but only by half as much as assumed under the proportional reductions that I just discussed. The illustration assumes that power projection ships include aircraft carriers (whose aircraft can attack land-based targets), carrier escorts, amphibious warfare ships (whose troops can be put ashore to attack), and logistics ships that support forward deployed naval forces. Although attack submarines can perform several tasks that are useful in the power projection mission, they are not usually considered to be designed principally for power projection and so are not protected under this illustrative approach.

When coupled with the three alternative levels of funding considered in this testimony, this emphasis on strategic deterrence and projection of power does not greatly alter estimates of the total numbers of ships. By the year 2020, the fleet would vary in size from 384 ships to 486 ships, depending on whether annual funding declines by 4 percent or does not decline at all (see Table 4). This range is similar to the range assuming proportional cuts in funding for all types of ships.

However, the composition of the fleet in the year 2020 would be quite different. Ships involved principally in power projection would remain close to the Navy goal. For example, under all three funding levels, the Navy has 13 or 14 deployable aircraft carriers--at or close to the goal of 14 carriers. Carrier escorts range from 96 to 104 ships--reasonably close to the Navy's goal of 120 such ships.

TABLE 4. SIZE OF THE FLEET UNDER DIFFERENT FUNDING LEVELS IN 2020 ASSUMING INCREASED EMPHASIS ON SHIPS USED FOR POWER PROJECTION AND STRATEGIC DETERRENCE

Type of Ship	No Real Growth	2 Percent Real Decline	4 Percent Real Decline
Ballistic Missile Submarines	24	24	24
Attack Submarines	71	51	34
Deployable Aircraft Carriers	14	13	13
Battleships	0	0	0
Carrier Escorts[a]	104	101	96
Frigates[b]	68	66	66
Other[c]	205	174	151
Total	486	429	384

SOURCE: Congressional Budget Office.

a. Cruisers, destroyers, and ships referred to as battle force capable (BFC) ships in the Surface Combatant Force Requirements Study.

b. Frigates and ships referred to as protection of shipping (POS) ships in the Surface Combatant Force Requirements Study.

c. Mine warfare, amphibious warfare, combat logistics, patrol, and support ships.

But ships involved primarily in sea control decline precipitously. Even with no real growth, there are only 71 attack submarines. With 4 percent annual budgetary declines, the Navy of the year 2020 would have a force of only 34 attack submarines.

The results suggest a difficult problem for planners. If budget cuts are deep, then favoring one mission over another drastically reduces the less favored mission. The results also reflect a trend in future shipbuilding budgets. Over the next 30 years, funding in the shipbuilding account will be concentrated in two programs: attack submarines and ships that escort aircraft carriers. If total budgets do not grow, or decline, emphasizing the procurement of one of these two types will require significant reductions in procurement of the other.

CONCLUSION

Defense budgets are likely to decline over the next few years, perhaps sharply. It is too early to know how much of that decline will be visited on the shipbuilding budget, but it probably will not escape entirely. If shipbuilding budgets decline, the fleet will eventually decline in size. For example, assuming 4 percent annual declines, the fleet in the year 2020 would have no more than about 390 ships, about two-thirds of today's size.

Such a decline may require the Navy to reconsider the priority of its missions, emphasizing one or more over others. It is not too soon to begin to reconsider these missions. The sooner the process begins, the more time will be available to make the difficult but important decisions about the size and composition of the fleet the Navy will operate in the 21st century.

APPENDIX A. TABLES

TABLE A-1. SHIP PURCHASES REQUIRED TO MEET NAVY GOALS, 1991-2020

Designator[a]	Type of Ship	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
AGF	Command Ship	0	0	0	0	0	0	0	0	1	0
AGOS	Surveillance Ship	0	3	3	2	0	0	0	0	0	0
AK	Cargo Ship	0	0	0	0	0	0	0	0	0	0
AOE	Logistics Station Ship	1	0	3	0	1	1	0	1	0	1
AOEV	Logistics Shuttle Ship	0	0	0	0	2	0	1	0	0	1
AR	Repair Ship	0	0	0	1	0	0	1	1	1	2
AS	Submarine Tender	0	0	0	0	0	3	0	0	0	0
ASR	Rescue Ship	0	0	0	0	0	0	2	1	0	0
ATF	Fleet Tug	0	0	0	0	0	0	0	0	0	0
ATR	Salvage/Rescue Ship	0	0	0	1	0	3	0	0	0	0
CVN	Aircraft Carrier	0	0	0	0	1	1	0	1	1	1
DDG	Guided Missile Destroyer	5	10	0	10	0	6	6	6	6	6
LHD	Amphibious Assault Ship	1	0	1	0	1	0	1	0	0	1
LSD	Dock Landing Ship	1	1	1	1	1	1	1	0	0	0
LX	New Amphibious Ship	0	0	0	0	0	1	0	2	2	3
MCM	Mine Countermeasure Ship	0	0	0	0	0	0	0	0	0	0
MHC	Coastal Mine Hunter	3	4	5	0	0	0	0	0	0	0
PHM	Small Combatant	0	0	0	0	0	0	0	0	0	0
SSBN	Ballistic Missile Submarine	1	1	1	1	1	1	1	0	0	0
SSN	Attack Submarine	2	0	6	0	7	4	4	4	4	4
	Total	14	19	20	16	14	21	17	16	15	19

TABLE A-1. (Continued)

Designator[a]	Type of Ship	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
AGF	Command Ship	0	0	0	0	0	1	0	0	0	0
AGOS	Surveillance Ship	0	0	0	0	0	0	0	0	0	3
AK	Cargo Ship	0	0	1	0	0	0	0	0	0	0
AOE	Logistics Station Ship	0	1	0	1	0	1	0	1	0	0
AOEV	Logistics Shuttle Ship	1	0	1	0	1	0	1	0	1	1
AR	Repair Ship	0	0	0	0	0	0	0	1	1	0
AS	Submarine Tender	0	0	1	1	1	1	0	0	0	0
ASR	Rescue Ship	0	0	0	0	0	0	0	0	0	0
ATF	Fleet Tug	0	0	0	0	0	0	0	0	0	0
ATR	Salvage/Rescue Ship	0	0	0	0	0	0	1	2	0	0
CVN	Aircraft Carrier	0	1	0	0	1	0	0	0	0	0
DDG	Guided Missile Destroyer	6	6	6	6	6	6	6	6	4	6
LHD	Amphibious Assault Ship	0	0	0	0	0	0	0	1	1	1
LSD	Dock Landing Ship	0	0	0	0	0	0	0	0	0	0
LX	New Amphibious Ship	3	3	3	3	3	3	0	0	0	0
MCM	Mine Countermeasure Ship	0	0	0	0	0	0	0	0	0	0
MHC	Coastal Mine Hunter	0	0	0	0	0	0	0	0	0	0
PHM	Small Combatant	0	0	0	1	0	0	1	3	1	0
SSBN	Ballistic Missile Submarine	0	0	0	0	0	1	1	1	2	1
SSN	Attack Submarine	3	3	4	2	2	4	4	4	4	4
	Total	13	14	16	14	14	17	14	19	14	16

(Continued)

TABLE A-1. (Continued)

Designator[a]	Type of Ship	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
AGF	Command Ship	0	0	0	0	0	0	0	0	0	0	2
AGOS	Surveillance Ship	4	2	1	2	5	2	3	1	0	0	31
AK	Cargo Ship	0	0	0	0	0	0	0	0	0	0	1
AOE	Logistics Station Ship	0	0	0	0	0	0	0	0	0	0	12
AOEV	Logistics Shuttle Ship	1	1	1	1	1	1	3	1	1	0	21
AR	Repair Ship	0	0	0	0	0	0	0	0	0	0	8
AS	Submarine Tender	1	1	0	0	0	0	0	0	1	0	10
ASR	Rescue Ship	0	0	0	0	0	0	0	0	0	0	3
ATF	Fleet Tug	0	0	0	0	2	3	2	0	0	0	7
ATR	Salvage/Rescue Ship	0	0	0	0	0	0	0	0	0	0	7
CVN	Aircraft Carrier	0	1	0	1	0	0	0	0	0	1	10
DDG	Guided Missile Destroyer	7	5	10	0	10	0	6	6	7	5	169
LHD	Amphibious Assault Ship	1	0	0	0	0	0	0	0	0	1	10
LSD	Dock Landing Ship	0	0	0	0	0	0	0	0	0	0	7
LX	New Amphibious Ship	0	0	0	0	0	1	1	1	1	0	30
MCM	Mine Countermeasure Ship	0	0	1	0	3	3	1	3	2	1	14
MHC	Coastal Mine Hunter	0	0	0	0	0	0	1	1	2	1	17
PHM	Small Combatant	0	0	0	0	0	0	0	0	0	0	6
SSBN	Ballistic Missile Submarine	2	0	1	1	1	1	1	1	1	1	23
SSN	Attack Submarine	3	2	2	3	3	4	4	3	2	4	99
	Total	19	12	16	8	25	15	22	17	17	14	487

SOURCE: Congressional Budget Office.

a. Designators are symbols used by the Navy to refer to ship types. They are not acronyms.

TABLE A-2. SHARES OF MAJOR SHIP PROCUREMENT FUNDING, BY TYPE OF SHIP (In percent)

Type of Ship	1991-2000	1991-2020
Attack Submarines	34	35
Carrier Escorts	31	34
Aircraft Carriers	13	9
Ballistic Missile Submarines	7	8
All Other Major Ships	15	14

SOURCE: Congressional Budget Office.

NOTE: Estimates assume that the Navy receives all funding required to move toward its current goals

APPENDIX B

METHODS USED TO ESTIMATE THE SHIPBUILDING COST OF MEETING THE NAVY'S GOAL

This appendix describes the method used to estimate the numbers and types of ships necessary to meet the Navy's goal and the cost of those ships. An analogous method was used to estimate the size of the fleet that would result if SCN budgets are held constant or decline in real terms.

The need to buy new ships depends on when vessels currently in the fleet will retire, and whether the number of ships in the fleet in any year represents a shortfall relative to the Navy's goals. The cost of buying those ships depends primarily on the unit cost of new vessels.

PLANNED RETIREMENTS

The Navy's need to buy new ships to meet its goals is determined in part by the retirement of ships currently in service. For planning purposes, the Navy assumes that ships retire at the end of an average expected service life, which varies by ship class. Specifically, aircraft carriers are assumed to retire after 45 years; newer aircraft carrier escorts and all auxiliary ships after 40 years; amphibious warfare ships after 35 years; ballistic missile submarines, attack submarines, and frigates after 30 years. The analysis assumes that after aircraft carrier escorts reach 20 years of age, they will perform roles currently performed by frigates.

The Navy retains flexibility in deciding when to retire ships. Some ships will remain in service past their expected retirement date if they can continue to perform their missions in a cost-effective manner. Others will be retired before they reach the end of their expected service life because they can no longer perform their wartime missions effectively or because they are too expensive to continue to operate. Recently, as a response to reduced budgets, the Navy has decided to retire ships before they reach the end of their expected service life. The assumptions on service life used in this analysis, therefore, are unlikely to be applied in a strict manner to all ships. Rather, they are reasonable estimates that are consistent with current Navy planning and practices.

DECIDING WHEN TO BUILD NEW SHIPS

CBO developed a shipbuilding model that estimates the number of major ships that would have to be funded in each year between 1991 and 2020 to reach and sustain the Navy's goals. This results of this model are detailed in Table A-1.

For fiscal years 1991 to 1994, CBO assumed that ships were funded in accord with the shipbuilding plan that the Navy submitted to the Congress with its 1991 budget request.

The Navy's shipbuilding plan for 1995 and subsequent years is not publicly available. For each of these years, CBO estimated shipbuilding requirements using one of two methods.

For types of ships for which the number of vessels in the fleet fell short of the Navy's goals, the plan continues to fund ship construction--at production rates similar to those the Navy envisioned for 1991 to 1994--until the goals are reached. For example, the Navy is well short of its goal for surface ship escorts for aircraft carriers, and the Surface Combatant Force Requirements Study, which the Navy endorsed in 1988, recommended construction of five or six new carrier escorts per year. Thus, the estimates for 1995 and later years fund six new escorts per year until the goal of 120 escorts is met, around 2010.

For ships for which the number of vessels in the fleet matched the goal, the shipbuilding plan funded the construction of new ships only to replace older vessels when they are retired at the end of their expected service life. This method ensures that shortfalls will be prevented once goals have been reached.

Because ships take many years to build, CBO assumed that the Congress would fund most new ships four years before they are needed to replace retiring vessels. Aircraft carriers would be funded about eight years in advance and submarines five years in advance because they take longer to build. In some cases, the service life of aircraft carriers was extended slightly to account for the fixed capacity in the one shipyard in the country that builds carriers.

ESTIMATING COSTS

For most ship types, CBO based its estimates of shipbuilding costs on recent ship purchases and purchases in the near future for which the Navy has provided the Congress with budget information. For some ships, especially support ships that have not been procured recently, we used historical costs to estimate the cost of replacement ships.

CBO assumed that unit construction costs for ships remain constant in real terms through 2020. While recognizing that such projections are inherently uncertain, this assumption is probably an optimistic one. Historical analyses of new ship construction costs indicate that new ship costs rise over time, especially between generations of ships. Should ship production rates fall, as they could if the shipbuilding budget is reduced, then ship costs could reasonably be expected to rise above those assumed. Unit costs could also increase because of modifications designed to meet new threats. CBO did provide an alternative estimate of the size of future SCN budgets assuming that unit costs rise by an average of 2 percent a year in real terms.

To arrive at total costs for meeting the Navy's goal, we summed the amounts required for major ships, then increased that amount to account for items other than major ships that are funded in the SCN account. In addition to major ships, the SCN account funds programs such as the procurement of smaller vessels and major overhauls for aircraft carriers. These other programs totaled about 14 percent of the SCN account between 1981 and 1990. CBO assumed that this percentage would remain constant over the next 30 years and added these costs to the costs of major ships to estimate total SCN funding.

Senator **Kennedy**. Mr. Berger, do you want to make a presentation to us? Is there anything you want say?

Mr. **Berger**. No. I think we will just answer questions, Mr. Chairman.

Senator **Kennedy**. Okay. Now, I will ask Senator Exon if he would like to question first. If you have to go, I will be glad to recognize you.

Senator **Exon**. Mr. Chairman, thank you very much. And thank you Senator Cohen for your consideration.

Let me follow up on a point that you made, Mr. Hale. It seems to me that it is very clear from testimony that we received that the two priority considerations—the three, perhaps, of the Navy—are the carriers, the new *Seawolf* attack submarine and, certainly, the Trident boat. Those are the three primary considerations.

Do you have any offhand answer to this question? I think sometimes we dwell too much on the number of ships. You did mention, I believe, in your testimony, that with new innovations, the *Seawolf* would be a significant step forward in attack submarines. If this is so, it would seem to me that we could fully justify a lesser number of submarines if we had the technology advantages that the *Seawolf,* as one example, would give us.

Do you have any offhand, ballpark figures as to how superior the *Seawolf* is? Could we, for example, reduce the number of our attack submarines, i.e. two or three attack submarines, for every one *Seawolf* that we bring on line? I am going to be asking the Navy the same question. I was wondering if, in your studies and evaluations, there is any ratio that you have set in that regard as we look forward to reducing the overall costs?

Mr. **Hale**. I think I will let the Navy try to quantify that for you, Senator. Clearly, the *Seawolf* is more capable, but you have to ask against what. If the Navy is going against a threat that is also increasing, then perhaps its capability is offset. If, on the other hand, the Navy is facing a threat that is constant, it would seem reasonable there could be some trade-off involving fewer of the more capable *Seawolf.*

I think it is inevitably highly judgmental what that trade-off ought to be against the SSN-688 class submarines. Numbers do count. If you are going to maintain a barrier or other things, you certainly need a minimum number regardless of how good the submarines are. So, it would probably also depend upon the scenario you face.

But I think your general point is well taken, particularly if the Soviet threat does not continue increasing as it has not. In that case, it would seem reasonable that we could accept a smaller fleet since the Navy is buying much more capable vessels.

Senator **Exon**. In your opening statement, you mentioned several times 12 battle carrier groups involving our aircraft carriers. Is there anything magic about the number 14 or 12 or 10 or 8? Given what you know of the reduced threat and assuming there is not a significant buildup in addition to what the Soviets, for example, already have, do you have any threat scenarios as to where you could recommend 12 or 10 or 8 battle carrier groups?

Likewise, in the strategic area, what numbers of Trident boats do you think would be in order, given the reduced threat and the significant budget reductions that we are facing?

Mr. **Hale**. I would like to keep my job at CBO, Senator Exon; I will stop short of recommendations. But it does seem to me that, with a lessening chance of war in Europe, the demand for carriers will be ever more driven by peacetime requirements. And there one has to make a judgment about how many the Navy wants to keep deployed. As you know, the classic ratio for deployment is 3-to-1; if the Navy has 12 carriers, it will be able to keep on the order of four deployed in an average peacetime period, which would be a substantial fleet but not what it has had in the past. I think the Navy would fairly ask where does it not want a deployed carrier? Is it going to do with one fewer carrier in the Mediterranean?

That is an arguable proposition.

So I cannot give you a recommendation, but I can try to help you think about it by suggesting that more emphasis on sizing the carrier force to peacetime commitments may be appropriate.

Senator **Exon**. My last question, Mr. Chairman, has to do with your evaluation as to the present situation. You must have thought about it; it must have come up in your study somewhere along the line. Traditionally, the U.S. Navy has done an outstanding job in providing for the national defense. The U.S. Navy, I believe, would like to have 500 to 600 ships ready to leave the port the day after tomorrow if necessary.

I am wondering if the Navy has taken into full consideration the fact that under the scenarios that we have discussed in our series of threat assessment hearings, that it is not likely given the new environment that the Navy would be called upon to quickly deploy its entire fleet of ships. Has the new environment been taken into consideration as you continue to examine the cost of the U.S. Navy? Do you think perhaps the U.S. Navy is going to have to reorganize its roles and missions, given the significant change in the world situation and the threat militarily to the United States?

Mr. **Hale**. It is my sense from watching all this debate that none of us has had time to fully take into account what has happened. There has been such an incredible change in world events in the last 6 months, that I suspect the Navy is only gradually coming to grips with how much the threat is reduced and what its missions ought to be. My sense is that the Navy is heading toward more emphasis on power projection in lower-intensity conflicts. If that is so, and I do not suggest this as a recommendation, it would seem that the sort of illustration that was offered in its testimony placing more emphasis on power projection vessels, including carriers, carrier escorts and amphibious ships—may make sense.

But as I said, I would like to keep my job with CBO and, therefore, I want to stop short of a recommendation.

Senator **Exon**. Thank you, gentlemen.

Thank you, Mr. Chairman.

Senator **Kennedy**. Senator Cohen?

Senator **Cohen**. Mr. Hale, thank you for your presentation.

On page 13 of your written report, you indicate that a reduction in the threats facing the Naval forces is less clear than is the case for other military forces. Then on page 14 you indicate that "a gradual reduction in fleet size would suggest, that in principal, the United States could reduce SCN funding during the 1990s and then, if things seem to worsen, the country would reverse and build up in the next century."

Do you think there would be sufficient warning time to proceed with the separate buildup of more ships if that threat increases?

Mr. HALE. I think CBO was raising that point, in part, to make the point I think you are driving at—that it would take a long period of warning, especially since the shipbuilding industry is likely to decline. Only a soothsayer knows the future, but I guess I would have concerns whether the Navy would be able to build up quickly enough.

Senator COHEN. It is rather unlikely, is it not? This would suppose that we are going to see a reduction in the number of ships we are going to be producing, and also that we can afford to live with that particular type of situation; but then, should the threat increase, we would turn around and suddenly expand the production? It does not happen in shipbuilding that way; it takes a long time to build ships; does it not?

Mr. HALE. Yes. And I think that is a fair point. We tried to make that point. We were sort of, as I say, setting it up to question because we do hear that argument, and CBO is pointing out that it would take a long time. We are talking probably about decades to build up again, or at least a decade.

Senator COHEN. If we assume there are going to be fewer ships and a reduction in the SCN account, then it is inevitable, is it not, that you are going to have a higher unit cost for the ships?

Mr. HALE. I think it is likely, unless the Navy chooses to buy different kinds of ships. It will have smaller production runs, which may not affect the shipbuilding—the hull—as much as it will affect all the parts that go into it, such as radars. So, yes, I think CBO has been conservative in these estimates by not assuming growth.

Senator COHEN. So you would say that, if we look to reduce the shipbuilding account, then we should not use overly optimistic projections as far as holding unit costs level?

Mr. HALE. I think it would be realistic to assume some increases. We have, as I said, tried to indicate that. It is inevitably speculative how much the costs would increase, and that is why we did not quantify them more firmly.

Senator COHEN. Also, I noticed that your projections for aircraft carriers do not seem particularly realistic. On page 27, you indicated funding for five carriers in a 6-year period. In your judgment, is it realistic for us to assume that there would be five carriers funded in 6 years?

Mr. HALE. Well, in the sense of whether the Congress would do it, you are probably right. CBO is trying to give a notion of what you would need in the way of funding if you were going to build the fleet up to the Navy's publicly stated goals and retire carriers at 45 years. As you well know, the Navy faces a major obsolescence problem early in the next century. That is what drives those numbers. Will the United States do that? I hear you saying no, and I would not disagree with you.

Senator COHEN. Okay; a final point. As we move into this era of reduced tensions with the Soviet Union—is there is a basic assumption that we, as either policy makers or appropriators, are to make a judgment that there is a lower threat posed by the Soviet Union—all of the information that I have received is as that threat diminishes—and assuming it is irreversible, which one cannot assume, but assuming it to be irreversible or the likelihood of its being reversed is not high—every assessment I have read shows that we have to deal with what you call a low-intensity conflict. This could include a surge in the level of terrorism; of conflicts of a regional nature, particularly in the Middle East; and threats to the supply lines for oil coming through the Persian Gulf. Would that, in your judgment, dictate that we give greater emphasis to "power projection", rather than to dealing with the Soviet Union. In other words, not constructing more attack submarines, or trying to structure our Naval forces to deal with the Soviet Union, but deal with the kinds of threats that we are likely to see beyond the year 2000?

Mr. **Hale**. Again, it seems reasonable to me that the Navy would head in that direction. I am loathe to——

Senator **Cohen**. If that is the case, does not that just argue against the notion that we should reduce the number of carrier battle groups? In other words, if you are going to emphasize power projection, that would not mean emphasizing submarines, would it?

Mr. **Hale**. Well, I think the submarine community would disagree. But, it seems to me that they are primarily a sea control asset. Yes, I think it would not primarily include them.

Senator **Cohen**. That is all I have, Mr. Chairman.

Senator **Kennedy**. Thank you.

As I understand it, the importance of this excellent report is that we are going to have to at least have some priorities established, and that without a sense of the priorities, then we have a percentage cut. My own sense is that you are going to have to skew a defense budget more in favor of shipbuilding and take it off some other areas. That is another issue for another time.

If we just do the percentage of cuts, then we really have to ask ourselves what missions we are going to be able to perform and what missions we are not, and whether we are going to be able to do some well or none of them very well. I think that, given the flow lines and the chart lines that you present, what it is doing is that it is requiring policy makers in the Navy, and certainly the President and the Congress, to have to make some choices as to where we want to move. What I gather from these flow lines and statistics, is if they all come just across the board, it is not going to be a satisfactory resolution of the current situation in a way that is consistent with our own security interest.

Now, you have, at least in the projections, given us at least a scenario that does provide for force projections and also maintains deterrent capability for the reduction in terms of the attack submarines. Now that is certainly one scenario. In the complete report, you outline at least the possibility of the number of ships that may fall within that, and obviously, that can be adjusted or changed. What are the other types? That is one scenario that you used. What are the other types? Did you give thoughts to other kinds of scenarios?

Mr. **Hale**. For balance, I suppose that CBO might look at one that emphasizes sea control. But I think the discussion from all of you up there suggests that an emphasis on attack submarines may not be consistent with many people's view of where the world is heading.

I suspect there are some other options that go beyond the shipbuilding budget that you will want to consider, Mr. Chairman. The use of more Reserves has been raised by Senator Nunn, and CBO has tried to assist in analyzing that issue by laying out some options. Again, that would not affect the SCN budget so much as it might give us a backup, if you will, a flexibility to rebuild that, as Senator Cohen pointed out, the Navy will not have if it simply buys fewer ships.

CBO might also look at either the increased use of Selected Reserves or new approaches like Senator Nunn's nested ships. So I think a second option might be to cut the Active fleet and try to maintain some flexibility to rebuild with greater use of Reserves. There are no doubt other alternatives, and I think we will be glad to hear your ideas, or your staff's, about things that CBO should lay out for you.

Senator KENNEDY. We talked just briefly in terms of our industrial base, about our shipbuilding capability. Of course, if we have a change in the circumstance, it is going to take any adversary a reasonable amount of time to build up as well. I mean, we can get into their capability now and what is out there and what is realistic.

Either through agreements or through just closing down various kinds of seagoing vessels, I imagine it will take any adversary a reasonable time to gear up, as long as it will take us. Am I correct in that?

Mr. HALE. It seems fair. I guess the hard question is whether the United States will recognize that an adversary is gearing up. Democracies are not good, I think, at recognizing that kind of unfortunate development. But in principle, if we do recognize it, yes, I think your point is well taken.

Senator KENNEDY. Have you made any assessment of what the impact of reductions would be on our industrial base and shipbuilding capability, given the fact that we are only building one commercial ship in the country at the present time?

Mr. HALE. Assuming there is no resurgence of commercial shipbuilding, I think the best answer to that is to give you an idea of how many ships the Navy buys compared with what it has been buying. In the 1980s, it bought 18 a year on the average. Under this 4 percent decline, it would buy about 11 a year on average.

Now, I do not know that the effects would all be proportional to the ships the Navy buys, but I think it suggests a substantial reduction, perhaps by one third, in shipbuilding capacity. Again, it might not work out to be quite that much because the number of yards might not be proportionately reduced. But I think it has got to suggest a reduction in our capacity.

Senator KENNEDY. We also have requested that you include the aircraft procurement and operating support costs related to shipbuilding programs. I understand that is being reviewed as well. Do you have any preliminary assessment about whether including these additional parts of the puzzle lead to different conclusions?

Mr. **Hale**. Well, not in quantitative terms yet, Mr. Chairman. But I think that the picture is not likely to get a lot rosier. It may get bleaker. I doubt that the aircraft budgets are going to be a source of funds for shipbuilding. The Navy has the A-12 coming along; it is buying the P-7. As those finish up, the Navy is going to have to consider a replacement for the F-14 or an upgrade.

And similarly, I rather doubt that unless there are major force cuts, the operating accounts are going to be a good source of money for shipbuilding. Historically, as the Navy has bought more expensive assets—ships and aircraft—operating costs have tended to go up also. So there may well be upward pressure in the operating accounts.

I think the bottom line is that, if the Navy faces cuts in its budget, it is going to have a much smaller fleet. That is probably the only way it will be able to accommodate the cuts in the long run.

Senator **Kennedy**. Thank you very much. When will the other preliminary report be ready?

Mr. **Hale**. It will be several months. Let us work with your staff on the timing to be sure that it is helpful, Mr. Chairman.

Senator **Kennedy**. Thank you.

[The information referred to follows:]

Unit Costs Assumed

Designator[a]	Description	1991 Unit Cost (Millions of 1990 Dollars)	1992-2020 Unit Cost (Millions of 1990 Dollars)
AGF	Command Ship	n.a.	325
AGOS	Surveillance Ship	n.a.	125
AK	Cargo Ship	n.a.	225
AOE	Logistics Station Ship	385	350
AOEV	Logistics Shuttle Ship	n.a.	350
AR	Repair Ship	n.a.	350
AS	Submarine Tender	n.a.	350
ASR	Rescue Ship	n.a.	75
ATF	Fleet Tug	n.a.	25
ATR	Salvage/Rescue Ship	n.a.	100
CVN	Aircraft Carrier	n.a.	3,350
DDG	Guided Missile Destroyer	689	700
LHD	Amphibious Assault Ship	961	875
LSD	Dock Landing Ship	232	250
LX	New Amphibious Ship	n.a.	325
MCM	Mine Countermeasure Ship	n.a.	150
MHC	Coastal Mine Hunter	86	75
PHM	Small Combatant	n.a.	50
SSBN	Ballistic Missile Submarine	1,336	1,200
SSN	Attack Submarine	1,454	1,250

SOURCE: Congressional Budget Office based on Department of Defense data.

a. Designators are symbols used by the Navy to refer to ship types. They are not acronyms.

n.a. = not applicable.

Funding for the Shipbuilding and Conversion, Navy Budget Account
To Meet Navy Shipbuilding Goals
(Billions of 1990 Dollars of Budget Authority)

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
10.8	10.6	13.4	10.7	18.0	18.7	14.4	16.5	16.3	18.7

SOURCE: Congressional Budget Office.

Senator **Kennedy**. Mr. Ferber, we will be happy to hear from you.

STATEMENT OF MARTIN M. FERBER, DIRECTOR, NAVY ISSUES, GENERAL ACCOUNTING OFFICE; ACCOMPANIED BY FRED BIGDEN, GENERAL ACCOUNTING OFFICE; AND DICK SILVEIRA, GENERAL ACCOUNTING OFFICE

Mr. **Ferber**. Thank you.

Senator **Cohen**. Let the record show that I have just advised Senator Warner we are down to eight carriers now.

Senator **Kennedy**. I just heard the word "carrier" somewhere in this building. [Laughter.]

Mr. **Ferber**. Mr. Chairman, members of the subcommittee, I am pleased to appear here today to discuss the status of the Navy's SSN-21 *Seawolf* submarine, its BSY-2 combat system, and the DDG-51 *Arleigh Burke* class destroyers. With me are Fred Bigden, who has done our SSN-21 work, and Dick Silveira, who has done our DDG-51 work.

This year we have issued reports to this subcommittee on the SSN-21 and BSY-2. We have issued a report to the Secretary of Defense on the DDG-51. I have a prepared statement that I would like to summarize.

Overall, our concerns of both programs are similar. They are concurrent programs where major subsystems are being developed while the ships are under construction. Also, several ships are being bought before the lead ships are operationally tested.

Mr. Chairman, you have questioned whether it is still a necessity for as much concurrency in weapons systems, given the changing world environment. Declining defense budgets may also greatly impact the Navy's plans for the systems we are discussing today. As you know, the Secretary of Defense is currently reviewing the SSN-21 and DDG-51 programs, and his recommendations are due at the end of the month.

Specifically, he is looking at what attack submarine and destroyer capabilities the United States needs; the extent to which the SSN-21 and DDG-51 programs provide these capabilities; and fiscal and acquisition considerations including cost, schedule and performance. I would like to briefly summarize our reports.

The SSN-21 will be larger, quieter, tactically faster, and deeper diving than the Los Angeles class submarines, the last 19 of which are currently under construction. The SSN-21 will also carry more weapons than earlier classes of attack submarines. Critical to the SSN-21 achieving its mission requirements is the successful development of the BSY-2 combat system, an advanced computer based system. The SSN-21 and BSY-2 are being developed as separate programs, each under the direction of its own program manager and subject to its own management system. Both are highly concurrent.

The Electric Boat Company began construction of the first SSN-21 in October of 1989 and delivery is scheduled for May 1995 at an estimated cost of $1.9 billion. For fiscal year 1991, the Navy requested $3.5 billion for the second and third ships, two combat systems and long lead items for fiscal year 1993 budget.

To meet its planned delivery date of May 1995, the SSN-21 program is using a concurrent scheduling approach, that is construction ongoing while ship design is continuing. Current plans call for as many as 15 ships at an estimated cost of $21 billion to be on contract or under construction before the first ship is available for operational testing. The SSN-21's construction schedule is driving the development and production schedule of its BSY-2 combat system.

In our January 1990 report, we expressed our concern that the SSN-21 program could be high risk because development of the BSY-2 is one of the most technically challenging and complex software development efforts undertaken for a submarine. The BSY-2 combat system will require up to 800 software personnel to develop and integrate about 3.2 million lines of code, over 2 million of which is planned to be written in a new Ada programming language.

Mr. Chairman, at your request, we are continuing to review the technical development of the BSY-2 and will report on that later.

Concerning SSN-21 affordability, in April 1990, we reported that fiscally constrained budgets and the $44 billion cost of the SSN-21 program may not allow the Navy to buy all 29 SSN-21s. The Navy's attack submarine construction plan is based upon several assumptions that, in our opinion, may not be achievable. To execute the construction plan within a shipbuilding budget that would, for example, grow at an annual rate of 3 percent, the Navy would have to: increase the percentage of shipbuilding funds allocated to attack submarines from 19 percent to 26 percent, reduce the average construction time from 65 months to 52 months and receive authorization for about three ships per year.

Further, during a period of 3 percent negative real growth, the Navy's attack submarine program could consume to up to 36 percent of its shipbuilding budget.

I would now like to discuss the *Arleigh Burke* Destroyer program. The DDG-51 will replace retiring destroyers and will be equipped with the Aegis combat system. The lead ship's complex design incorporates features to increase the ship's ability to survive during battle. For example, it will have a seakeeping hull, all-steel construction and a system to protect the crew from contaminated air.

Initially, the lead ship was scheduled for delivery in September 1989, but Bath Iron Works encountered delays in designing and constructing the lead ship. Bath Iron Works is now making an extraordinary effort to meet planned delivery in February 1991. The

Navy has awarded contracts for 12 follow-on ships out of a planned program of 33 ships estimated to cost $27 billion.

Prior to award of the last five ships in February 1990, we expressed our concern that much work still had to be done on the lead ship. At that time, it was estimated at 50 percent complete and already seven follow-on ships were under contract. We believed that DOD should consider not awarding the five additional ships until sea trials scheduled for this fall were done. DOD disagreed and awarded contracts for five ships.

Until Bath Iron Works completes the lead ship and it undergoes sea trials this fall, the Navy will not know if integration of the Aegis combat system and the various other systems are effective. For example, new systems such as the Collective Protective System and Data Multiplex System are still being incorporated on the lead ship. The Navy's own assessment was that extraordinary efforts were needed to incorporate these systems to meet the ship's delivery schedule. At the same time, we now have 12 follow-on ships under construction at both Bath Ironworks and Ingalls Shipbuilding.

Senator COHEN. Excuse me. Under construction?

Mr. FERBER. I am sorry. Under contract.

If problems develop on the lead ship, corrections may require changes in design to follow-on ships or retrofitting.

For fiscal year 1991 the Navy is requesting $3.6 billion for another five ships. Like the SSN-21 program, achieving the planned DDG-51 program of five ships per year will require an increasing share of the Navy's shipbuilding program in an era of declining defense budgets.

In conclusion, we believe the changing world environment may provide the opportunity to reduce concurrency in shipbuilding programs. At the same time, affordability issues of the SSN-21 and the DDG-51 will likely require the Navy to make important tradeoff decisions. It is our hope that the Secretary of Defense's mandated review of the attack submarine and destroyer programs will provide the high level attention programs of this importance deserve.

This concludes my remarks, and we will be happy to answer questions.

[The prepared statement of Mr. Ferber follows:]

Statement of
Martin M Ferber, Director
National Security and International Affairs
Division

Mr. Chairman and members of the Subcommittee:

I am pleased to appear before the Subcommittee today to discuss the status of the Navy's Seawolf attack submarine (SSN-21) program, its combat system (AN/BSY-2), and the Arleigh Burke class destroyers (DDG-51). This year we have issued reports to this Subcommittee on the SSN-21 and the BSY-2 and we issued a report to the Secretary of Defense on the DDG-51.

Overall, our concerns on both programs are similar. They are highly concurrent programs where major subsystems are being developed while ships are under construction. Also, several ships are being bought before the lead ships are operationally tested.

We recognize that shipbuilding may present a unique challenge because of the time it takes to develop and build a ship. Last year, the Congress enacted a provision that recognized that a number of ships could be on contract prior to completion of operational test and evaluation on the lead ship. However, with as many as 15 of a planned buy of 29 SSN-21s (over 50 percent) and 13 of a planned buy of 33 DDG-51s (nearly 40 percent) under contract before the lead ship of each class is tested, we are concerned that the Navy may be overusing the exemption. Also, independently, each program consumes a large part of the Navy's shipbuilding budget.

Chairman Nunn has questioned whether there is still a necessity for as much concurrency in weapon systems given the changing world environment. We testified (Concurrency in the Acquisition Process, statement of Frank C. Conahan, GAO/T-NSIAD-90-43, May 17, 1990) before Chairman Nunn last week and share his concern. Although concurrency can be used to expedite the development and production of weapon systems, our work has shown that after a significant expenditure of procurement dollars, several high cost concurrent systems and subsystems do not perform as intended. We believe that DOD can no longer afford to concurrently develop and procure these high cost systems without knowing early whether the desired capability can be demonstrated. We also believe that the recent changes in the national security environment mean that we can wait until we know whether systems work before we buy them.

Declining defense budgets may also greatly impact the Navy's plans for the systems we are discussing today. As you know, the Secretary of Defense is currently reviewing the SSN-21 and DDG-51 programs and his recommendations are due at the end of this month. Specifically, he is looking at what attack submarine and destroyer capabilities the United States needs; the extent to which the SSN-21 and DDG-51 programs provide these capabilities; and fiscal and acquisition considerations, including cost, schedule, and performance.

I would like to briefly summarize our reports on the SSN-21, BSY-2 and DDG-51. The reports' summaries are included as appendices to this statement.

SSN-21 SEAWOLF SUBMARINE

The SSN-21 will be larger, quieter, tactically faster and deeper diving than Los Angeles class attack submarines (SSN-688)--the last 19 of which are currently under construction. The SSN-21 will also carry more weapons than earlier classes of attack submarines.

Critical to the SSN-21 achieving its mission requirements is the successful development of the BSY-2 combat system, an advanced computer system designed to enable the submarine to detect and locate targets faster than existing submarine combat systems can, allow operators to perform multiple tasks and address multiple targets concurrently, and reduce the time between detecting a target and launching weapons. This is to be accomplished through computer-aided detection, classification and tracking, the use of a wide aperture array hull mounted sensor, and enhanced information management.

The SSN-21 and BSY-2 are being developed as separate programs, each under the direction of its own program manager and subject to its own management system. Both are highly concurrent. The BSY-2 is to be provided as government-furnished equipment to the submarine shipbuilder.

The Navy is using two shipyards to design the SSN-21 -- the Electric Boat Division of General Dynamics and the Newport News Shipbuilding and Dry Dock Company. Newport News is responsible for the submarine's overall design under a $343 million cost-plus-fixed-fee contract. Electric Boat is designing the engine room and its equipment under a $212 million cost-plus-fixed-fee contract. Some research and development and detailed design efforts will continue concurrently with construction of the first SSN-21.

In January 1989, the Navy awarded Electric Boat a construction contract for the first SSN-21. Delivery is scheduled for May 1995 with an estimated cost of $1.9 billion. The Navy expects the unit cost of the next three SSN-21s will decline and that the fifth and subsequent SSN-21s will not exceed $1 billion each in 1985 base year dollars which would equate to $1.3 billion in today's dollars. For fiscal year 1991, the Navy is requesting $3.5 billion for the second and third ships, two combat systems, and long lead time items for the fiscal year 1993 program.

The BSY-2 is critical to the submarine achieving its full mission and performance capabilities. The Navy has no alternate combat system planned should the BSY-2 development be delayed. In March 1988, the Navy awarded General Electric a fixed-price incentive fee contract worth up to $1.84 billion to develop the BSY-2 combat system and produce the first unit for the lead submarine, with options for two more systems and related items. Full-scale engineering development is scheduled to proceed into fiscal year 1996. Total development and procurement costs for 29 planned BSY-2 combat systems are estimated to be $7.4 billion in then-year dollars.

We continue to have several concerns that must be addressed in the SSN-21 and BSY-2 development.

Concurrency

To meet its planned delivery date of May 1995, the SSN-21 program is using a concurrent scheduling approach that has construction ongoing while design is continuing. Current plans call for as many as 15 ships, at an estimated cost of more than $21 billion, to be on contract or under construction before the first ship is available for operational testing.

The SSN-21's construction schedule is driving the development and production schedule of its combat system. In 1988 the Navy stipulated that the delivery of the first BSY-2 was required by November 1993 to meet the scheduled delivery of the first SSN-21. However, when the Navy awarded the full-scale development contract for the combat system, it agreed to have all system hardware and about 86 percent of its software delivered to the Navy by that date. The remaining software would be delivered in November 1994.

In our January 1990 report (Navy Acquisition: Cost, Schedule, and

Performance of New Submarine Combat Systems, GAO/NSIAD-90-72, Jan. 31, 1990), we expressed our concern that this program could be high risk because development of the BSY-2 is one of the most technically challenging and complex software development efforts undertaken for a submarine. The BSY-2 combat system will require up to 800 software personnel to develop and integrate about 3.2 million lines of code -- over 2 million of which is planned to be written in the new Ada programming language. Our report also discussed some submarine redesign caused by BSY-2 changes and, more recently, we have learned that because of increased weight of the BSY-2 hardware, additional redesign may be necessary. The shipbuilder has not yet made a full assessment of this impact.

In his April 1990 report on "Concurrency in Major Acquisition Programs" the Under Secretary of Defense said that the overall risk assessment of the BSY-2 was considered low for performance and schedule and moderate for cost. However, this differs from an internal DOD assessment by the Special Assistant on software and computer technology in the Office of the Director of Defense Research and Engineering who identified several potential problems that could prevent delivery of the BSY-2 system in time to support the planned May 1995 delivery date for the SSN-21. For example, the Special Assistant was concerned that General Electric does not have enough personnel with Ada training, and those that are trained need more expertise.

At your request, we are continuing to review the technical development of the BSY-2.

Affordability

The Navy plans to buy 29 SSN-21s by the year 2000 at an estimated cost of about $44 billion in then-year dollars.

In April 1990, we reported (Navy Ships: Status of SSN-21 Ship Construction Program, GAO/NSIAD-90-163, April 19, 1990) our concern that fiscally constrained budgets and the cost of the SSN-21 may not allow the Navy to buy all 29 SSN-21s. The Navy's SSN construction plan is based upon several assumptions that, in our opinion, may not be achievable.

To execute the SSN construction plan within a shipbuilding budget that would, for example, grow at an annual real rate of 3 percent, the Navy would have to

-- increase the percentage of shipbuilding funds allocated to SSN construction from 19 to 26 percent,
-- reduce average planned SSN construction time from 65 months to about 52 months,
-- receive authorization and funding for an average of about three ships per year, and
-- incur no cost overruns requiring supplemental funding.

Further, during a period of zero or 3 percent negative real growth budgets, the Navy's planned SSN program could consume up to 36 percent of its shipbuilding budget.

DDG-51 ARLEIGH BURKE DESTROYER

The DDG-51 will replace retiring destroyers and will be equipped with the AEGIS combat system. The lead ship's complex design incorporates features to increase the ship's ability to survive during battle. For example, it will have a seakeeping hull, all steel construction and extensive armor around vital spaces, and a system to protect the crew from contaminated air.

Initially, the lead ship was scheduled for delivery in September 1989, but Bath Iron Works encountered delays in designing and constructing the lead ship. For example, it planned to use mostly computer-aided design, but it was unable to. Bath Iron Works is now making an extraordinary effort to meet a planned delivery in February 1991.

The Navy has awarded contracts for 12 follow-on ships out of a planned program of at least 33 ships estimated to cost $27 billion. Prior to the award of the last five ships in January 1990, we expressed our concern that much work still had to be done on the lead ship -- it was estimated at 50 percent complete -- and that 7 follow-on ships were already under construction or contract (Navy Shipbuilding: Cost and Schedule Problems on the DDG-51 AEGIS Destroyer Program, GAO/NSIAD-90-84, Jan. 17, 1990). We believed that DOD should have considered not awarding contracts for additional ships until after sea trials scheduled for this coming fall. DOD disagreed and awarded contracts for five ships.

We continue to be concerned about the concurrency in the DDG-51 program and its affordability.

Concurrency

Until Bath Iron Works completes the lead ship and it undergoes sea trials this fall, the Navy will not know if the integration of the AEGIS combat system and various systems is effective. For example, new systems such as the collective protection system and a data multiplex system are still being incorporated on the lead ship. The Navy's own assessment was that extraordinary efforts were needed to incorporate these systems to meet the ship's delivery schedule. At the same time, follow-on ships are under construction at both Bath Iron Works and Ingalls Shipbuilding. If problems develop on the lead ship, corrections may require changes in design to follow-on ships or retrofitting. The Navy would likely be responsible for these costs.

Although DOD's Office of Developmental Test and Evaluation categorizes the DDG-51 as a highly concurrent program, the Under Secretary of Defense's recent report on concurrency did not include the DDG-51. We have been told by DOD that was an oversight.

Affordability

DOD has determined that the original fixed-price incentive contract may no longer be appropriate for developing the DDG-51 and last fall changed the cost-sharing ratios, which significantly increased DOD's costs while eliminating Bath Iron Work's projected losses under the original contract terms. In our January 1990 report we expressed our concern about the potential impact on other programs because over 50 percent of competitively awarded fixed-price incentive shipbuilding contracts were experiencing cost growth.

Lead ship design and construction costs have increased significantly since the original estimate. Before restructuring the contracts design costs were expected to more than double, from $111 million to $247 million, and construction costs were expected to grow by more than 60 percent, from $157 million to $253 million. In April 1990 the estimated costs for design and construction were $516 million. However, DOD believes that the total cost of the lead ship after integrating all systems, including the government-furnished AEGIS combat system, will still be under the original estimate of $1.25 billion (in 1985 dollars) -- approximately $1.45 billion in current dollars. The Navy's February 1991 buy of 5 ships cost about $700 million each.

For fiscal year 1991, the Navy is requesting $3.6 billion for another 5 ships. Like the SSN-21 program, achieving the planned DDG-51 program of five ships per year will require an increasing share of the Navy's shipbuilding program in an era of declining defense budgets. For example, at 3 percent negative real growth the DDG-51 program will consume 32 percent of the fiscal year 1991 requested shipbuilding budget.

CONCLUSIONS

In conclusion, we believe that the changing world environment may provide the opportunity to reduce concurrency in shipbuilding programs. One of the justifications for concurrency, if not the main justification, has been the urgent need to field a system to respond to the threat which several analysts now see as lessening.

At the same time, affordability issues of the SSN-21 and the DDG-51 will likely require the Navy to make important trade-off decisions. It is our hope that the Secretary of Defense's mandated review of the attack submarine and destroyer programs will provide the high level attention programs of this importance deserve.

This concludes my prepared remarks and I would be pleased to respond to any questions.

GAO

United States
General Accounting Office
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National Security and
International Affairs Division

B-236761

April 19, 1990

The Honorable Edward M. Kennedy
Chairman, Subcommittee on Projection
Forces and Regional Defense
Committee on Armed Services
United States Senate

The Honorable John R. Kasich
House of Representatives

This report is the unclassified version of the classified report we provided you in November 1989 on the results of our review of the Navy's Seawolf Nuclear Attack Submarine (SSN-21) construction program. Our objectives were to address the program's status, the SSN-21's performance capabilities, and the Navy's ability to maintain the nuclear attack submarine (SSN) force structure.

Results in Brief

The Navy is using two shipyards to design the SSN-21 and is proceeding with its ship construction plans. During the research and development phase, the program experienced some cost increases and a revised delivery schedule. Indications are that further cost increases and schedule adjustments are possible, and it is unclear whether overall performance goals will be met since the lead submarine will not be available for testing until 1995. The SSN-21's shipbuilding plan is designed to achieve the Navy's 100 SSN force goal. However, fiscal constraints and ship cost may prevent the Navy from achieving its SSN force goals.

Background

The 100 nuclear attack submarine force is a keystone of the Navy's maritime strategy and the new SSN-21 is to be one of the principal components of that force. The Navy sees no alternative to the SSN-21 in providing the quantum improvements needed in submarine warfighting capability. According to the Navy, the SSN-21 is needed because of Soviet deployments of more capable and quieter SSNs and because space and weight limitations prevent further performance improvements to the Los Angeles class nuclear attack submarine (SSN-688). Designed to be quieter, deeper diving, and tactically faster, the SSN-21 also will carry more weapons than the SSN-688s being built today. In addition, a new combat system (AN/BSY-2) is expected to provide the SSN-21 with a greater capability to detect, classify, localize, and launch weapons against enemy targets. (See app. I.)

The SSN-21 construction program is a major Navy initiative. Between fiscal years 1989 and 2000, the Navy plans to award contracts for 29 SSN-21s, including combat systems, at an estimated cost of $36 billion. The SSN-21 program is completing its detail design phase, and in January 1989 the Navy awarded the Electric Boat Division of General Dynamics Corporation a construction contract for the first ship. Some research and development and detail design effort will continue concurrently with construction of the lead submarine. Construction of the first ship began in October 1989 and delivery is scheduled for May 1995. In terms of 1985 base year dollars, the first SSN-21 is estimated to cost $1.6 billion and the Navy expects the unit cost of the next three SSN-21s will decline to the point that the fifth and the 24 following SSN-21s will not exceed $1.0 billion each.

Program Status

The SSN-21 shipbuilding program has experienced cost increases over estimates and a 6-month schedule adjustment. Newport News Shipbuilding—the lead shipyard for submarine design—has reported increased costs under its cost-plus-fixed-fee design contract that has an authorized cost of $343 million. Not yet included in the authorized cost is $5 million for submarine redesign caused by changes in the configuration of the combat system. Electric Boat, which is designing the engine room and its equipment also under a cost-plus-fixed-fee contract with an authorized cost of $212 million, shows a cost increase in its cost report. The Navy contended that the cost increase figure was invalid because the contractor's budgeted costs, against which actual costs were compared, were incomplete. The amount of the individual cost increases is considered to be proprietary by the contractors. According to the Navy, it agreed to a 6-month schedule adjustment for constructing the first SSN-21 to secure a lower price.

The AN/BSY-2 combat system development program could further exacerbate the SSN-21 program's cost and schedule problems. Managed separately from the SSN-21 program, the AN/BSY-2 is critical to the submarine achieving its full mission and performance capabilities. The combat system's development schedule is set by the ship's construction schedule, and the Navy has no alternate system planned should the AN/BSY-2 development be delayed. In October 1988 Newport News Shipbuilding indicated to the Navy that, on the basis of its assessment, it believed the AN/BSY-2 development program was 12 to 16 months behind that needed for the lead submarine delivery schedule. The Navy has since extended delivery of the lead submarine 6 months, to May 1995.

As of March 1989, design of the combat system was about 3 months behind schedule and two important Navy design reviews had been delayed about 5 months. In addition, the Department of Defense (DOD) has identified problems in developing two combat system components. Further combat system changes could have a major impact on completed SSN-21 design, with an adverse effect on program cost and schedule.

Until the first SSN-21 is built and fully tested, the Navy will not know the exact extent to which the SSN-21 will achieve its performance goals. Except for the two components, component and system development test results appear satisfactory.

A more detailed discussion of the SSN-21 program and the AN/BSY-2 combat system is provided in appendix II.

Operational Testing

Section 2366 of title 10 of the United States Code provided that major defense acquisition programs may not proceed beyond low rate production until operational testing and evaluation is completed. The acquisition schedule for the SSN-21 program provides that contracts for 14 submarines are to be awarded before the first ship is available for operational testing. The Navy plans to begin construction of the second and third SSN-21s more than 4 years before the lead ship is ready for operational testing.

In an opinion dated February 27, 1989, we concluded that the SSN-21 program could not proceed beyond low-rate initial production on the basis of "early operational assessments" that did not constitute operational testing.[1]

The Navy believed that waiting for operational testing of the first SSN-21 before contracting for more submarines would delay the program 5 or 6 years and entail a large cost increase. The Navy, therefore, had no plans to change its acquisition schedule. However, in its comments on a draft of our November 1989 report, DOD indicated that actions were underway to seek legislative relief from the current requirement. Subsequent to our November report, the Congress resolved this issue in the Navy's favor.

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[1] GAO letter to the Chairman, Legislation and National Security Subcommittee, House Committee on Government Operations, B-222886, Feb. 27, 1989.

SSN-21 Affordability

The Navy believes the SSN-21 will allow it to maintain far-term submarine superiority into the next century. Yet, fiscally constrained budgets may not allow the Navy to buy all of the SSN-21s it needs to achieve and maintain its 100 SSN force. To achieve its SSN force goal and execute its SSN-21 shipbuilding program, the Navy, according to our analysis, with sustained annual shipbuilding and conversion budget growth of 3 percent above inflation, will need to increase the SSN's share of the shipbuilding and conversion budget from 19 to 26 percent. Further, during a period of zero or negative real growth budgets, the Navy's planned SSN program could consume up to 36 percent of its total shipbuilding and conversion budget, which may affect Navy total force structure decisions. (See app. III.)

The Navy could achieve its SSN force level goals by building a mix of SSNs. This might entail acquiring fewer SSN-21s and more of the less costly SSN-688s. However, the Navy does not consider this a viable alternative to the SSN-21 program. According to Navy officials, if SSN-21 affordability becomes an issue they would rather reduce the SSN force level.

Conclusions

Without aggressive funding, the Navy will probably have difficulty achieving its SSN force goal and executing its SSN-21 program. SSN-21 affordability issues will likely require the Navy to make total force, as well as SSN force, trade-off decisions. The Navy also may experience difficulties in achieving its current SSN-21 construction plan because the AN/BSY-2's development, which is critical to the SSN-21 construction program, may not be completed when the first submarine is delivered. The SSN-21 will not be operationally tested until after construction of the second and third ships has started; therefore, the Navy will not precisely know whether the SSN-21 will provide the warfighting capabilities needed.

Recommendations

In our November 1989 report, we recommended that the Secretary of Defense direct the Secretary of the Navy to either (1) ensure that the SSN-21 and its combat system undergo operational testing and evaluation before proceeding past low-rate initial production, as required in the law, or (2) seek legislative relief that would change the law to either exempt shipbuilding in general or the SSN-21 program specifically.

Agency Comments and Our Evaluation

DOD generally agreed with our report and with the facts as presented. In some cases it disagreed as to how those facts were characterized and provided an update to the Navy's SSN force structure data. Where appropriate, we modified the report to reflect DOD's position.

DOD agreed with our recommendation that the Navy either seek legislative relief or comply with the law. It indicated that actions were underway to seek legislative relief from the current requirement. In November 1989, Public Law 101-189 was enacted, which allows shipbuilding programs to proceed prior to the completion of operational testing of the first ship.

This report was prepared under the direction of Martin M Ferber, Director, Navy Issues, who may be reached on (202) 275-6504 if you or your staff have any questions. Other major contributors are listed in appendix IV.

Frank C Conahan

Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

To meet new Soviet threats and ensure continued U.S. submarine superiority, the U.S. Navy has initiated development of two new advanced combat systems. These systems—the AN/BSY-1 and the AN/BSY-2—are to be installed in improved Los Angeles (SSN-688) and new Seawolf (SSN-21) class nuclear attack submarines, respectively. The life-cycle costs for the two systems have been estimated at over $26 billion.

The Chairman, Subcommittee on Projection Forces and Regional Defense, Senate Committee on Armed Services, requested that GAO examine the status of the Navy's submarine combat system development programs. Specifically, GAO determined whether these two combat systems will meet cost, schedule, and performance goals and whether the combat system being developed for SSN-21s can avoid developmental problems experienced with the SSN-688 combat system.

Background

In 1980 the Navy began developing an advanced combat system for improved SSN-688s authorized in fiscal year 1989 and beyond. Originally, it planned a single-phased program. However, in October 1983 the Secretary of Defense accelerated the program and approved a three-phased plan to apply to SSN-688s authorized, starting in fiscal year 1983—a 6-year acceleration.

Because of ambitious program objectives and schedules, cost, schedule, and technical problems surfaced causing the Navy to restructure the program into two separate development efforts—AN/BSY-1 for use on improved SSN-688s and AN/BSY-2 for SSN-21s. These combat systems are designed to improve data processing and management capabilities. With the use of new and more capable computers, new data displays, and additional software, certain tasks, such as searching for, detecting, and tracking targets, will be more automated. System operators can thus perform multiple tasks, address multiple targets concurrently, and process tactical data faster and more accurately than they can with prior systems. Collectively, these capabilities are designed to reduce the response time between initially detecting a target and launching a weapon.

Results in Brief

The Navy's submarine combat system development programs are experiencing problems. AN/BSY-1 program problems raise questions as to when the improved SSN-688s will be fully mission capable. Because of continued ambitious development objectives and schedules for the combat system development program, the Navy allowed insufficient time in the development schedule to resolve technical problems. As a result, the AN/BSY-1 systems will provide the SSN-688s improved performance capabilities in the acoustics and weapons launch areas, but the systems will be less capable in other areas. Also, the capabilities will be delivered later and cost more than originally planned under the earlier program.

The Navy has taken steps to reduce risks in the AN/BSY-2 program. However, it appears that potential problems in the AN/BSY-2 are similar to those experienced in developing prior submarine advanced combat systems, including the AN/BSY-1. In order to meet the SSN-21's construction schedule, the Navy also has established ambitious objectives and schedules for the AN/BSY-2 development program. As a result, the first combat system will not have full capabilities when delivered to the shipbuilder. In addition, combat system development problems could adversely affect the planned cost, schedule, and performance of the first SSN-21.

Principal Findings

The Navy continues to establish ambitious program objectives and schedules in its development of complex submarine combat systems. As a result, the Navy must accept less than fully capable combat systems in order to meet the shipbuilders' schedule.

AN/BSY-1 Has Experienced Problems

The estimated life-cycle costs for the AN/BSY-1 have increased from $5.4 billion to $12.1 billion for 19 and 24 systems, respectively. The first four systems will not have full AN/BSY-1 offensive capabilities and will be upgraded during the submarines' post shakedown availability period. Therefore, these submarines will not be able to perform a full range of missions. In addition, the AN/BSY-1 will provide less capabilities than originally planned under the original submarine advanced combat system program.

AN/BSY-1 design changes were the major cause of several improved SSN-688s under construction being modified. These changes also resulted in one shipyard being awarded almost $82 million for changes to five submarines and another requesting a $150 million contract adjustment for modifications for nine submarines. The first nine AN/BSY-1-equipped submarines will be delivered an average 17 months late to the Navy.

AN/BSY-2 Will Not Have Full Capabilities When Delivered

Like the improved SSN-688 program, the need to meet the SSN-21 ship construction schedule also is affecting the AN/BSY-2 development program. As a result, the prime contractor does not have sufficient time to deliver the first combat system with full capabilities to the Navy. Remaining capabilities are scheduled to be delivered to the Navy in November 1994.

AN/BSY-2 Development Problems Could Adversely Delay Further System Delivery

As of November 1989, AN/BSY-2 development was about 3 months behind the program's current schedule and further delays are expected. Delays have resulted in deferring two Navy critical system design reviews and some critical item testing. Until the Navy completes these reviews, the prime contractor is unable to begin developing most hardware and writing most system software code.

Recommendations

GAO is not making recommendations in this report.

Agency Comments

The Department of Defense (DOD) generally agreed with GAO's report and with the facts as presented on the AN/BSY-1 but only partially concurred with GAO's findings on the AN/BSY-2. In those cases where it partially agreed with the report, DOD provided further elaboration. (See app. II.)

DOD agreed that AN/BSY-1 combat system design changes were a major contributor to submarine delivery delays and cost increases but added that other design changes also contributed to the submarines' delays and cost increases. Regarding the AN/BSY-2, DOD stated that the slippage of the preliminary design review and the critical design review had no impact on the scheduled delivery of the system to the Navy. Although DOD agreed that some critical item tests have been delayed, it stated that many have been satisfactorily completed. Also, DOD agreed slowness in subcontract definitization increased program risks but added that no subcontractor design effort is being delayed.

Executive Summary

Purpose

The Navy currently plans to acquire at least 33 Arleigh Burke (DDG-51 class) guided missile destroyers at a total cost of about $27 billion. The ships will replace retiring battle-force destroyers and will be equipped with the AEGIS combat system. Originally, the Department of Defense (DOD) estimated the total cost of the lead ship at about $1.25 billion (in 1985 dollars) after design, construction, and outfitting with the AEGIS combat system.

The lead ship's complex design incorporates features to increase its ability to survive during battle. For example, it will have a seakeeping hull, which increases stability by reducing vertical motion; all-steel construction and extensive armor around vital spaces; and a collective protection system to protect the crew from contaminated air.

Because of the program's importance to the Navy mission and its significant costs, GAO assessed the status of the program.

Background

In April 1985, the Navy awarded Bath Iron Works a fixed-price incentive contract for the lead ship of the DDG-51 class destroyers. Bath Iron Works was responsible for designing the ship, which included integrating the AEGIS combat system and other government-furnished equipment. The contract called for ship construction to begin in May 1987, with delivery of the ship to the Navy in September 1989.

The Navy has awarded construction contracts for seven additional, or follow ships. The Navy awarded the contract for the second ship (DDG-52) in May 1987 to Ingalls Shipbuilding and the contract for the third ship (DDG-53) in September 1987 to Bath Iron Works. Contracts for five additional ships (DDGs 54 through 58) were awarded in December 1988—three to Bath Iron Works and two to Ingalls Shipbuilding.

Results in Brief

Bath Iron Works has encountered problems in designing and constructing the lead ship. As a result of these problems and Navy changes in the contract requirements, costs have increased substantially over the original contract estimate. Design and other problems contributed to two revisions to the ship's delivery schedule. The revisions, in January 1987 and February 1988, delayed the expected delivery by 17 months. Bath Iron Works is now accelerating construction to meet the planned delivery in February 1991.

While Bath Iron Works estimates that more than 50 percent of the lead ship is complete, the major part of outfitting the ship still has to be done. The combat system and certain other technical components have to be installed and integrated within the ship. Often in the development of new systems, it is these activities and the subsequent testing of the complete system that surface problems that could affect follow ships' schedule and cost. Therefore, GAO believes that DOD should ensure that sufficient information exists on program development and affordability before the award of contracts for follow ships beyond the seven awarded to date.

Principal Findings

Design Delays

Bath Iron Works planned to prepare production drawings using computer-aided design, but major problems arose. The computer equipment did not have adequate data storage capacity needed to design a complex warship. Design delays were also due to Navy changes in ship requirements, late government-furnished design data for the reduction gear, and difficulties with several developmental systems. As of November 1989, Bath Iron Works and Navy representatives believed that design problems had been resolved and production drawings were essentially complete. GAO believes that the installation and integration of the ship systems, which still has to be done, could surface additional design or performance problems.

Construction Problems

Design and other problems contributed to two revisions to the ship's scheduled delivery, totaling 17 months. The last revision to the delivery schedule was made in February 1988. The ship, originally scheduled to be completed in September 1989, is currently scheduled for delivery in February 1991. Bath Iron Works is accelerating construction to meet this date.

Bath Iron Works had not been able to perform as much construction in the fabrication buildings as planned because of delays in preparing production drawings. Therefore, more construction has been required in the production yard, which is more time-consuming and costly.

Bath Iron Works launched the lead ship in September 1989. According to Bath Iron Works representatives, the ship was more than 50 percent complete in October 1989. However, to complete the ship requires incorporating and integrating the AEGIS combat system and demonstrating that other systems, such as the collective protection system, work as designed.

Cost Issues

According to the June 1989 cost performance report, the total cost for Bath Iron Works to design and construct the ship was estimated at about $500 million (in May 1984 dollars). Design costs were expected to more than double, from the original contract estimate of $111 million to about $247 million. Construction costs were expected to grow more than 60 percent, from $157 million to about $253 million. In September 1989, representatives of Bath Iron Works said that their estimate at completion had increased to $505 million and that costs could increase further. DOD believes that the total cost, after integrating the combat system, will still be under the original estimate of $1.25 billion (in 1985 dollars).

In September 1989, Bath Iron Works and the Navy modified the lead ship contract to resolve outstanding contractual issues. The issues were varied and included many technical matters. The modification provided for restructuring compensation to Bath Iron Works and, on the basis of information supplied by Bath Iron Works to the Navy, could increase Navy compensation as much as $71.7 million. Projected losses of about $41.5 million on design and construction would be eliminated.

GAO has reported that over 50 percent of competitively awarded fixed-price incentive shipbuilding contracts were experiencing overruns. Therefore, GAO was concerned that the contract modification for changing the lead ship contract terms could establish an inappropriate precedent. During the audit, GAO discussed this with Navy officials who said they expected the total cost of the ship to be under the original estimate and current shipbuilding appropriations were appropriate to cover the additional costs. DOD, in commenting on this report, stated that the restructuring will not set a precedent for future pricing of changes to Navy shipbuilding contracts because this instance presented a unique set of circumstances. GAO remains concerned about the modification in view of the high incidence of overruns on other fixed-price contracts.

Rescheduling of the First Two Follow Ships

In January 1989, the Navy modified the DDG-52 contract to provide for better helicopter support capabilities, which rescheduled the delivery date by 8 months. Also, the Navy has approved a proposal by Bath Iron Works to reschedule the DDG-53 construction schedule. The 7-month rescheduling will allow Bath Iron Works to more efficiently schedule its work on other ships it is building for the government. These ships will be delivered earlier than expected.

Other Follow Ships

Contracts for seven follow ships, including the DDG-52 and DDG-53, have been awarded and will be under construction before the lead ship is completed. A major program milestone—approval for full-rate production — is scheduled for July 1990. Before then, contracts for five more follow ships could be awarded. Moreover, contracts for another five ships could be awarded before the scheduled February 1991 delivery of the lead ship. Thus, as many as 17 follow ships could be under construction or awarded before the lead ship has finished testing and has been delivered.

Although the Navy and Bath Iron Works believe the potential for lead ship problems is minimal, much work needs to be done to complete the ship. Unanticipated lead ship problems may increase costs and delay deliveries for many follow ships. Because of the technical advances being made in the destroyer program and because the lead ship is still only about 50 percent complete, putting a large number of ships in construction or under contract seems to be a risky procurement strategy. Before contracting for additional ships, the Secretary of Defense should review the status of the destroyer program. This is especially important in light of current deliberations on force structure and budget reductions.

Recommendations

GAO recommends that the Secretary of Defense ensure sufficient information exists to justify the award of contracts for follow ships beyond the seven now under contract.

Agency and Contractor Comments

DOD commented that the probability of a major problem affecting follow ships is minimal and did not concur in our recommendation in the report draft. DOD said that it had complied with existing federal statute regarding the adequacy and the evaluation of tests necessary to proceed beyond limited production. It stated that the adequacy and results of testing would continue to be evaluated and would be an important factor in the deliberation and decision to award contracts for additional follow ships.

GAO maintains the thrust of its recommendation because the program risks are significant; however, GAO reworded the recommendation to emphasize the need for high-level assurance on the overall program development and affordability. If DOD is not able to provide the assurances, it should delay contract award for additional follow ships.

Bath Iron Works commented that the report did not assess the validity of the Navy's acquisition process—most importantly, the fixed-price incentive type of contract. Bath Iron Works commented that it has become widely recognized that the use of a fixed-priced contract is not workable or compatible with the developmental nature of a highly complex warship.

GAO did not review the appropriateness of a fixed-price incentive contract for the DDG-51 acquisition. However, in commenting on this report, DOD did not agree with Bath Iron Works that, at the time of contract award, a fixed-price incentive contract was inappropriate. DOD said the contract terms at the time of award were appropriate to balance the risk between the Navy and Bath Iron Works. It also said that while Bath Iron Works' bid was aggressive, it was not unreasonably low.

Senator KENNEDY. Okay. In the report, the GAO expressed its concerns over the concurrency between development and production of sophisticated weapon systems. Could your concerns be summarized as the risk that the Navy could end up paying too much to get weapons systems that do not work as well as we intended them to perform?

Mr. FERBER. Yes. I think that is exactly the best way to express the concern. You balance a risk in concurrency against what you expect to gain. I think an example of problems that can develop is the improved SSN-688 *Los Angeles* class submarines that were fielded with a combat system that was not totally mission capable. The combat system is currently undergoing technical evaluation and operational evaluation, which will continue on into next year. Only then will we know whether the combat system is really what we had in mind.

At the same time, in other work we have done on cost overruns in shipbuilding, attack submarines have the most cost overruns of all shipbuilding programs. I think, if you want to go back in history a little bit, if you go back to the late 1970s when we produced the FFG-7, we allowed a 2-year delay after the lead ship in order to develop the system and get things incorporated before we started a program of follow-on ships. I think history will show that that ship came in on schedule and under cost.

Senator KENNEDY. Part of the reason for concurrency is the nature of the threat. Another is the fragility of the basic vendor base or the capability of the industrial base. How would you suggest we reduce the concurrency in the shipbuilding program while still protecting shipbuilding modernization?

Mr. FERBER. I think you need to look at the industrial base for each system. I think they are unique. That is about all I can say. I think as an example, though, if we take the SSN-21, we currently have two shipbuilders building the improved SSN-688 class. And I think there may be some flexibility there to continue building the SSN-688 while further developing the *Seawolf*, rather than just shutting down the SSN-688 line and putting all our eggs in one basket, if you will, with the *Seawolf* at both shipyards.

Senator KENNEDY. Would that meet the requirements in terms of the protection of the industrial base?

Mr. FERBER. We have not done that specific assessment but I think it would go a long way, since both shipyards are producing SSN-688s. If we could have some kind of compromise where we continue the SSN-688 while we further develop the SSN-21, or concurrently produce SSN-21s, but maybe not as many as planned, we could preserve the industrial base in that case. As far as other programs, it would take——

Senator KENNEDY. Do you know what the budget implications of that would be? Would you figure that out?

Mr. FERBER. No, we have not.

Senator KENNEDY. We understand that judgments about concurrency may be somewhat subjective, but nevertheless, can you characterize the relative levels of concurrency risk in the SSN-21 and the DDG-51 programs?

Mr. FERBER. Yes. We would categorize the SSN-21 program as highly concurrent. You have really two concurrent programs, you have the submarine construction itself which is concurrent, and then you have the BSY-2 development, which is in itself concurrent. Then you are going to integrate these two programs. So, we think it is a highly concurrent program with all the risks that go along with that.

The BSY-2 is the most complex system the Navy has ever attempted. We have 3.2 million lines of software code; 2 million of it, though, will be produced in the new Ada language which we are just learning. The BSY-2 will also incorporate the new signal processor. So, we have a lot of new features that will be going into the BSY-2 as well as the submarine program itself. So, we view that as highly concurrent.

I would categorize the DDG-51 on the low end of the concurrency program. The DDG-51 is getting towards the end of its development; sea trials are scheduled for this fall. Our concern is the number of follow-on ships that we are producing while we still have not sent the first, the lead ship, to sea trials and delivered it to the Navy. That was our concern that we expressed earlier this year before the last award of five contracts.

What you need to assess there is what the impact it will have on follow-on ships. I will give you a couple of examples. The vendor for the sonar system for the lead ship has developed the first unit for the lead ship, but they will not be able to produce the units for the follow-on ships on time. The Navy, right now, is discussing a compromise where there will be less factory testing of the sonar before it is delivered. So, there is a risk there.

Second, the first follow-on ship, which is being done at another shipyard, has projections of significant cost overruns—$20 million to $40 million of cost overruns. We understand right now that the shipyard has estimated even higher overruns. The Navy and the shipyard are negotiating that. So, those are a couple of the problems that you can run into on concurrent programs.

Senator KENNEDY. Are those design changes?

Mr. FERBER. The changes stem from the fact that, while the lead shipyard is concurrently developing and producing the first ship, it also has to provide the follow-on shipyard with the drawings and the other data to produce the follow-on ship. You are going to learn, as you produce drawings and incorporate them on a ship. When you then provide them to the follow-on shipyard, they have changes in the way they were planning, based on preliminary data.

Senator KENNEDY. There are some who say there should be no concurrency; others testify before this committee that there should be as much concurrency as can be adequately managed in terms of the development of programs. Now these are judgmental issues or questions.

Mr. FERBER. You are very correct; they are judgmental. And concurrency has a risk with it, and you need to assess that on each program. We do not have a specific judgment on concurrency in general. I would say that when you go into a program what you need to look at is what you are technologically trying to develop on that program; how far you are pushing the state of the art and, therefore, allow enough time in that program to accomplish that.

One of the problems we have seen in DOD is that we get the watchdogs, if you will, within the Department, such as the operational test and evaluation folks to raise the flag about their concerns about pushing programs forward. But, as that goes up the chain of command, the Department gets very optimistic with a can-do attitude. We tend to push programs forward faster than really what we are achieving allows us to.

So, it is really an intensified management program that you have to put in place to manage the risk. You can have concurrency; you just need to manage it. Our concern is that it is being pushed too far on most programs.

Senator **KENNEDY**. Senator Cohen?

Senator **COHEN**. Thank you, Mr. Chairman.

Mr. Ferber, do I take from your testimony that, with any new war-fighting ship of any complexity, you would not recommend there be any contracts awarded for follow-on ships until after the sea trials of the first ship?

Mr. **FERBER**. No. That is not what I said, Mr. Cohen.

Senator **COHEN**. Well, you said that with respect to the DDG-51.

Mr. **FERBER**. Our concern on the DDG-51 was the number of ships there were under contract. We already had seven follow-on ships under contract earlier this year when we awarded five more. I think that, with sea trials coming this fall, we had an opportunity this year to wait until sea trials before going ahead with the next five. At 12 ships, we have over one-third of the program under contract already. If sea trials are slipped and we do not meet our current milestones early next year, we could be faced with another decision on another five ships without having delivered the first ship to the Navy.

Senator **COHEN**. Mr. Ferber, last Thursday, your superior, Frank Conahan, came before the full committee. He testified on the issue of concurrency risk in major defense programs. He indicated at that time that, compared to programs like the B-2, the C-17, the MX rail garrison, and the SSN-21, the DDG-51 destroyer did not rank in the same category of high-risk concurrency. You would agree with that, I assume.

Mr. **FERBER**. Yes.

Senator **COHEN**. Senator Kennedy asked you what would be the impact of a year's delay, or waiting until the sea trials are completed, upon—let us say—Navy cost projections, the shipyard's ability to retain skilled workers, shipbuilding learning efficiency, or the health of the supplier base. I think you testified about this at a House Committee last January; you were asked the same question, and I believe you indicated that you did not have that information. Have you made any attempt to get that information?

Mr. **FERBER**. We were asked to do that on another program, the B-1. We have not been able to get that information; we are in the process of trying to get that information on all systems. What we really need is for DOD and the contractor to come up with an estimate that we can evaluate.

Senator **COHEN**. Did you make any requests from Bath Iron Works for that kind of information?

Mr. **FERBER**. I did talk to Bath's CEO about it and he gave me his off-the-cuff projections, but, at that point in time the five ships had been awarded already. So, we have not done that now because there is no delay right now. There are 12 ships under contract; the next decision for five will not come up until next year.

Senator COHEN. That kind of information will be important as we make an assessment in terms of the GAO's recommendations about delay.

Mr. FERBER. I think that last week GAO was asked to do that on all systems. We are going to do that.

Senator COHEN. All right. Now, you testified before the House on January 24th about a self-initiated GAO audit of the DDG-51 shipbuilding program and about taking more than 2 years; and at that hearing you also testified to the fact that Bath Iron Works had provided full cooperation and access to GAO's review team during that extensive program audit.

Mr. FERBER. Yes, sir.

Senator COHEN. In response to questions, you testified that GAO was not the party responsible for a series of premature and inaccurate public releases of information that began last September that were, in fact, attributed in the press to the GAO's then-in-progress review of the DDG-51 program at BIW. Is that correct?

Mr. FERBER. Last fall we were asked to brief Chairman Dingell's staff, and we did brief them. The briefing contained factual data.

Senator COHEN. You did not release it to the press, however?

Mr. FERBER. No.

Senator COHEN. The GAO—also I think you indicated—would not have prematurely released information relating to hotline allegations about alleged misconduct against BIW for mischarging of costs. Is that correct?

Mr. FERBER. It is standard policy; we do not talk to the media on ongoing work.

Senator COHEN. Now, on May 9th of this year, the Kennebec Journal carried a front-page story which featured your description of the status of the investigation into allegations of mischarging and it attributes to you the following quote: "At this point, Bath Iron Works is not giving us the information we need." Is that an accurate statement?

Mr. FERBER. Yes, sir.

Senator COHEN. You mean, we, the GAO, or we, the GAO and the subcommittee in the House?

Mr. FERBER. We, GAO, had been asked by the subcommittee in the House to investigate the allegations of mischarging. Bath Iron Works has not given us the documents and access to people we need.

Senator COHEN. Mr. Ferber, let me qualify this and see if there is not some qualification to that testimony. I found it to be misleading to the general public. It is a fact that the GAO and Bath Iron Works, on four separate occasions, have reached a tentative agreement for the providing of all the information to the GAO. As a matter of fact, the last tentative agreement was proposed by Mr. Socolar of GAO. Each of these agreements would have allowed GAO to complete its investigation and make a report to Congress as of this time.

In each case, the tentative agreement was rejected by Congressman Dingell's staff. So, I think that you have to qualify your statement that BIW is not cooperating. They have reached an agreement with the GAO on four occasions.

I wrote, as a matter of fact, to Mr. Socolar. I have a letter in my possession that says that my statement of the facts is essentially correct, and that GAO reached a tentative agreement which would have allowed the investigation to go forward completely and have reported to Congress by this time, except for the objection of a congressional staff. I think you ought to indicate that when you make a statement to the public; that it is not GAO, but rather GAO and a congressional committee that is supervising this particular investigation.

Mr. **Ferber**. If I could just comment on that. We were asked to do an investigation. We deal with Bath Iron Works on trying to accomplish that investigation. We have both statutory and contractual rights to the documents of Bath Iron Works. We appreciate Bath Iron Works' concern about the information that the subcommittee staff gets and what they do with it. At the same time——

Senator **Cohen**. You say you have a concern, but you do not do anything about its release.

Senator **Kennedy**. Let Mr. Ferber give a response.

Mr. **Ferber**. We deal with Bath on a face-to-face relationship. It is our position that we are entitled, legally, to the information from Bath. We understand their concern, and we reached an agreement with them. Really it was just one agreement; the other agreements were at a much lower level. We reached a high-level agreement between Mr. Socolar and the CEO of Bath on providing us total access.

Bath's position on that was that we would be provided that access only if we did not give it to the requesting chairman prior to completion of our work. We do not have that authority. And Chairman Dingell has chosen not to make that negotiation. So, our hands are tied.

Senator **Cohen**. That is the point. The point was that Mr. Socolar and the head of Bath Iron Works had reached an agreement that this was satisfactory to the GAO. Correct?

Mr. **Ferber**. If Chairman Dingell agreed.

Senator **Cohen**. Then Chairman Dingell's staff or he himself disagreed with that.

I would like to go back and point out, Mr. Chairman, that this is important, because we have the reputation of a major contractor in this country, and certainly one that enjoys a nationwide reputation, being destroyed on a piece-meal basis by virtue of how this information has been handled in the past.

Information has been turned over to the GAO in the past, information which has ended up in the press to the detriment of Bath Iron Works. I would like to go over that, if I could, just to take a few moments, Mr. Ferber, and ask you initially: how many GAO employees are on loan or assignment to the House Subcommittee on Investigations for Energy and Commerce?

Mr. **Ferber**. Fifteen.

Senator **Cohen**. Fifteen. Is Mr. Tim Morrison one of those individuals?

Mr. **Ferber**. Yes, sir.

Senator **Cohen**. He is a GAO employee?

Mr. **Ferber**. He is a GAO employee assigned to the subcommittee.

Senator **Cohen**. How long has he been assigned to the subcommittee?

Mr. **Ferber**. Since last fall.

Senator **Cohen**. You have a working relationship with him?

Mr. **Ferber**. I am not sure I understand, a working relationship?

Senator **Cohen**. Are you friends? Do you work together? Does he report to you?

Mr. **Ferber**. No. When people are assigned to the Hill, they report directly to the subcommittee, and they are considered subcommittee employees. They are under no direction at all of GAO.

Senator **Cohen**. You have no control over their conduct?

Mr. **Ferber**. Day to day, no.

Senator **Cohen**. Do you think it is appropriate for any GAO employee on loan or assignment to a subcommittee to be talking to the press, requesting anonymity, inquiring how events are playing, how press reports are playing and backing in the local press?

Mr. **Ferber**. A GAO employee working for GAO would not do that because that is not part of our operational mode. If, as a Hill staffer, anyone who is following directions of the person they are working for, that is their call, not mine.

Senator **Cohen**. So Dr. Jekyll can become Mr. Hyde once he comes to the Hill?

Let me ask you, what is an engineering change proposal?

Mr. **Ferber**. An engineering change proposal is a proposal by the builder of the ship where he believes that something has changed in either what he can accomplish of what that the Navy asked him to do that requires a change in the contractual rights of the contractor or more money or redesign or what have you. He is looking to the government for an added benefit.

Senator **Cohen**. Is it different from an engineering change order?

Mr. **Ferber**. I believe an engineering change order would be the culmination of the proposal after negotiations.

Senator **Cohen**. The answer is, I assume, that there is a vast difference between a proposal and an order.

Mr. **Ferber**. Yes.

Senator **Cohen**. Someone in your position, certainly within GAO, who conducts this kind of investigation would be aware of the distinction between a proposal and an order; would they not?

Mr. **Ferber**. Yes.

Senator **Cohen**. All right. Would Mr. Tim Morrison know the difference between a proposal and an order?

Mr. **Ferber**. I could not tell you.

Senator **Cohen**. Is he not trained in this particular field?

Mr. **Ferber**. You are talking about people who look at specific contractual relationships on shipbuilding, and I am not sure if Mr. Morrison has had that exposure.

Senator **Cohen**. I have a letter which I would like to have entered into the record, Mr. Chairman. It is a letter from Mr. Bowsher, the Comptroller General and the head of the GAO, who states his concern about the information that has been released to the press. On page 2 of that letter he says, "While the information we turned over to the subcommittee was factual, Chairman Dingell in his letter to the Secretary of the Navy used the phrase '760 change orders,' whereas our briefing showed these are change proposals." There is a substantial distinction between your information being factual and what is released to the press.

Mr. **Ferber**. Mr. Morrison was not assigned to the committee at the time of that briefing last fall.

Senator **Cohen**. The Navy and Bath Iron Works have agreed on fewer than 300 change orders, with 50 more still under consideration. That is about half of what was alleged.

Second, "the Chairman said that the DDG-51 was 38 percent complete at launching in September, whereas we said the ship was 38 percent complete in June; two months had expired." So there is quite a substantial misrepresentation of the facts as to what was complete at the actual launching of the *Arleigh Burke*; is there not?

Mr. **Ferber**. In that letter we were explaining the difference between the briefing as we provided and the media accounts that came out.

Senator **Cohen**. When some information is turned over to you or to the GAO and it is marked For Official Use Only or Business Sensitive or Attorney/Client, does that deserve any special treatment in your opinion?

Mr. **Ferber**. Yes, it does.

Senator **Cohen**. Is that confidential information that is supplied to the GAO?

Mr. **Ferber**. Confidential? It is provided to us for official use, yes.

Senator **Cohen**. Right. Not to be released to the press?

Mr. **Ferber**. We do not release it to the press.

Senator **Cohen**. As a matter of fact, when something like that contains information that is stamped For Official Use Only, Business Sensitive or Attorney/Client, it has been the policy of the GAO not to release the information and to advise congressional committees that prior to the completion of the investigation, that is not to be released. Is that correct?

Mr. **Ferber**. Let me go over two things. When we brief on that kind of information—we have not provided those documents to the Hill in this case—we would brief that we are discussing proprietary information that should not be disclosed.

When we send draft reports to the Agency or to the Hill that include that, we have caution cover letters. I think it is important to note that the situation that you mentioned, where proprietary information as well as attorney/client information that was provided to the Chairman of the Oversight Committee was provided by the Navy, not by GAO.

Senator **Cohen**. Did the Navy not provide that information to you?

Mr. **Ferber**. We have some of the documents that were provided, but not all. The key there is that we did not provide that to Chairman Dingell; that was provided directly by the Navy to the Chairman's staff.

Senator **Cohen**. So any information that was turned over by Bath Iron Works to you concerning internal financial statements marked Business Sensitive——

Mr. **Ferber**. We have never given the Chairman any document from Bath Iron Works.

Senator **Cohen**. Well, the letter from the Comptroller General indicates that, in any event, GAO told his staff that all the data was preliminary and not for release. Nonetheless, the information was, in fact, released; was it not?

Mr. **Ferber**. Yes, sir.

Senator **Cohen**. As I take this time, Mr. Chairman, I appreciate your indulgence on this, because we have a situation in which information has been turned over to the GAO, to the Navy, which in turn is handed over to the congressional committee, appropriately so, and that information is then released to the press on a piecemeal basis. It contains erroneous information and is done at a time, which was the day before the launching of the *Arleigh Burke*, in order to cast a pall apparently over the ceremony itself.

Then the company is concerned about the integrity of the process and asks that the information at least be withheld until such time as the investigation is complete. Then we have GAO making public statements about having to subpoena the information because BIW is not complying.

I think there is something wrong with the system when a company's integrity cannot be protected at least until such time as the investigation is completed. I raise this as an issue here because I intend to raise it with the Chairman of the Governmental Affairs Committee. The issue is whether or not we need additional regulations concerning the release of information on a premature basis because it can create an inappropriate impression.

Senator **Kennedy**. Is there any final comment you want to make?

Mr. **Ferber**. The only thing I would add is I understand Mr. Cohen's concern. I think you need to appreciate that we are exercising two obligations: one is we are obligated to do work for committee chairmen and we routinely brief committee staffs on results of our work and interim findings. And we establish relationships with all of the staffs that we deal with.

Second, as far as a potential subpoena, we have a statutory and contractual right to the documents, and regardless of Bath Iron Works' concern, I appreciate their concern, but legally we are entitled to those documents. We have been asked to do a job, and in order to do that job we have to go forward with whatever legal recourse we need.

Senator **Cohen**. You say you share the concern of Bath Iron Works and that is a nice, easy expression on your part. But you have a company that is being either ridiculed or condemned on a piecemeal basis before any investigation is complete; you say, "well, we understand, but . . ."

Now, are you saying that perhaps we ought to change some of the statutory provisions so that if you are conducting an investigation, there will be strict procedures about releasing it on a piecemeal basis before your investigation is complete?

Mr. **Ferber**. That is your prerogative to pursue. But as we sit——

Senator **Cohen**. Under the circumstances, I am asking you whether or not you think that would be a fair and appropriate thing to do.

Mr. **Ferber**. I do not think that, considering all of the work we do and all of the people we deal with, that if there is a problem coming up in this case, one case, that we ought to put forward blanket correction that inhibits us talking to this Subcommittee staff as well as others on the hundreds of jobs we do each year.

Senator **Kennedy**. Senator Warner.

Senator **Warner**. Gentlemen, with respect to the SSN-21 program, on page 6 of your prepared testimony you state, "More recently we, the GAO, learned that because of increased weight of the BSY-2 hardware, additional redesign may be necessary. We have not yet made a full assessment of the impact."

Mr. Ferber, I understand that representatives from GAO a week ago visited the GE plant in Syracuse, N.Y. where the BSY-2 is being developed. There were wide-ranging discussions about the BSY-2, but there was, in fact, no mention of a weight problem involving the BSY-2 and the SSN-21. In fact, my information is that the weight problem concerned the SSN-688 class and whether it could accommodate the Wide Aperture Array, which weighs about 2 tons.

At that time, GAO learned that the Wide Aperture Array was too heavy to install in the SSN-688 class submarines equipped with the BSY-1, but there was no impact, whatsoever, on the *Seawolf* submarine.

Could you clarify this?

Mr. **Ferber**. Sir, the situation we are talking to does not come out of that meeting last week. In late April, representatives from our office were at Newport News Shipbuilding doing the follow-up work for this subcommittee on the technical aspects of the BSY-2, a follow-up to a report they issued last March. At that time Newport News Shipbuilding told us that they had updated data on the cabinets that are housing the BSY-2 and that the cabinets were expected to weigh 5 tons to 6 tons more than they thought. And it was their opinion, expressed to us, that redesign would be necessary and that they were in the process of assessing both the redesign that would be needed and the cost consequences.

So, it is sort of a different situation than the one you are talking about.

Senator **Warner**. Well, I will ask the Chair at the appropriate time to allow the Navy and Admiral Cooper to give their perspective on this because I think this is a rather important point and we want to have a clarification.

Now for the second issue. On pages 6 and 7, you make reference to an internal DOD assessment by the special assistant on software and computer technology of OSD. It identifies potential problems, specifically that according to this assessment, the prime contractor does not have enough personnel with Ada training and that those who are trained need more expertise.

Mr. Chairman, let the record show that the GAO is referring, so far as I am able to determine, to a memo written by Virginia L. Kaster to Dr. Paris Gianalis, dated March 19, 1990. Both of these individuals work in DDR&E. This is an internal memorandum which GAO has taken out of context.

The memo begins, "Because of a previously scheduled travel commitment, I will be unable to attend the action officers' meeting on Wednesday, March 21, 1990. However, I have attached a list of issues with corresponding questions to be reviewed and considered by the attendees during this meeting. In addition, I will be able to refine these issues and questions as required, based on the results of the decisions made during the meeting."

Mr. Chairman, the Navy has provided a paper to this committee, which comments on the GAO's concern and other issues that had been raised concerning the SSN-21, and I ask that it be placed in the record at this time.

Do you have any specific comment on that series of incidents?

Mr. **Ferber**. I would only add that last March, when we issued our report on the BSY-2, the technical evaluation at that time, we shared that concern on the number and adequacy of trained personnel. And we just made reference again to that memorandum which came out, initially, at hearings before Chairman Conyers several weeks ago.

Senator **Warner**. I thank the Chair, and I make the material a part of the record.

[The material referred to follows:]

ENCLOSURE 1: SSN-21 & BSY-2 ISSUES

SSN-21 SCHEDULE AND COST

Issue: SSN-21 delivery slipped six months.

Navy Response: Do not concur. The initial SEAWOLF completion date was estimated to be November of 1994 during the early stages of the program. During contract negotiations, however, the Navy determined that this completion date was one of the factors driving higher than expected lead ship bids. As a result, the Navy allowed the shipyards to set the most economically feasible delivery date of May 1995. There was no slip in the schedule. The Navy made this decision to reduce cost and optimize shipyard performance.

Issue: Design contract cost overran $38M at Newport News and $7.5M at Electric Boat.

Navy Response: Partially concur. The SSN-21 design is not complete. Initial design costs were underfunded. Many factors have increased the scope of the design effort since the SSN-21 is the first submarine to incorporate modular design. This experience, however, should have significant benefits in reducing recurring construction program costs of future ships.

Issue: Navy has issued contract to Newport News to design a new submarine.

Navy Response: Do not concur. There is no plan or a requirement for a follow-on submarine. The contract was for development studies and for the design, fabrication, and integration of engineering development models and prototypes and design improvements in direct support of the SEAWOLF. The contract also includes funding for studies related to the transition of the Congressionally directed Defense Advanced Research Projects (DARPA) advanced submarine technology effort into Navy submarine technology development. It is standard procedure for all such changes to be evaluated to determine their feasibility for installation on current and future submarine classes. The SEAWOLF is the Navy's only attack submarine under design. There is no design work being done on a follow-on submarine.

Issue: SSN-21 met only two of six goals established by the Navy in 1982.

Navy Response: Do not concur. No goals were established for SEAWOLF in 1982. An ad hoc committee, established by the Chief of Naval Operations in 1982, was tasked with assessing the predicted threat to a new SSN in the mid-1990s, summarizing the requirements for a new SSN in that time frame, and establishing a range of parameters for a new SSN. Six parameters were selected: speed, depth, torpedo tubes, arctic capability, broadband and narrowband radiated noise, and hull sonar sensitivity, each with a range of values. These values were never intended to be SSN-21 requirements; instead, they were viewed as a range of technologically and fiscally feasible possibilities. Using these ranges as a guide, in 1983 the Navy conducted a second in-depth study to determine what specific value of the six Group Tango parameters could be attained in an actual platform from an engineering standpoint, using present or near-term technology, and within fiscal constraints. Using this study, after careful consideration of the tradeoffs associated with optimizing different mission performance goals, the CNO established the SSN-21 top-level requirements in 1984. SSN-21 will meet or exceed all top level requirements when delivered in 1995.

AN/BSY-2 COMBAT SYSTEM

Issue: AN/BSY-2 Design Changes resulted in $5M cost to redesign SSN-21.

Navy Response: Partially concur. "Design changes" were due to differences between early engineering estimates and final contract design specifications. Cost increase is estimated; the final cost not yet been negotiated.

Issue: Although Navy Operational Test and Evaluation Force stated the AN/BSY-2 has the potential for improved effectiveness over prior systems, this cannot be demonstrated until the system is operationally tested. Also, no alternative system is planned.

Navy Response: Partially concur. Full operational testing will not take place until June 1995. Prior to that event, however, significant testing will take place. The BSY-2 combat system modular design allows parallel development, with incremental testing and delivery. Incremental testing allows early identification and correction of deficiencies which reduces design and schedule risk. A fully capable land based testing facility will be constructed and will be used for interim operational testing commencing in September 1993. This combination of modular development, incremental testing and extensive use of land based testing will allow accurate assessments of AN/BSY-2 development progress and makes an alternative system for the AN/BSY-2 unnecessary.

Issue: AN/BSY-2 program is behind schedule. Two Navy design reviews were delayed about five months.

Navy Response: Partially concur. AN/BSY-2 will be completed in time for delivery to the first SSN-21 on schedule. The preliminary Design Review (PDR) and Critical Design Review (CDR) were rescheduled to allow more maturity in design specification. The Executive Sessions for the PDR were held 3 October 89 and for the CDR 30 January 90, as re-scheduled. Delaying these reviews is expected to pay large dividends downstream through the reduction of engineering changes that frequently result from pre-mature freezing of design specifications. The contract with General Electric requires delivery of the first BSY-2 system four months prior to the date the Government must provide it to the shipbuilder, providing additional schedule margin. A design coordination working group has been established to ensure that all parties are sharing design concerns and issues. This group, consisting of the SSN-21 and BSY-2 program offices, General Electric (GE), and Newport News, will act to further mitigate schedule risks.

Issue: The first AN/BSY-2 will not be fully capable when delivered to the Navy.

Navy Response: Partially concur. SSN-21 will commission in May of 1995 with a fully capable BSY-2 combat system. The combat system delivered to the Navy in November 1993 will include all hardware and the software necessary to provide full end-to-end combat system capability on all arrays except the medium frequency active and the towed array ranging program. The final increment of software to provide full capability will be delivered in November 1994. This staggered delivery schedule was selected to reduce software development cost and schedule risks.

Issue: AN/BSY-2 software has development risks due to lack of retained code from prior systems.

Navy Response: Do not concur; the opposite is true. Retaining code from prior systems would increase risk due to differences between the BSY-2 and past systems in the areas of architecture and partitioning, depth and quality of documentation, interface definition, standards and conventions used, and language and operating systems compatibility.

Issue: Tests of critical AN/BSY-2 system items have been delayed.

Navy Response: Partially concur. While the start of some testing was deferred up to four months, all tests were completed within original schedule time frames. Tests were scheduled early to allow time if problems arose. Key tests such as beam former integrated circuit performance, wide aperture array flow noise, and cathode ray tube reliability, have been successfully completed. Remaining critical item tests are on track to support systems deliveries.

Issue: Institute for Defense Analysis (IDA) report stated that GE was "interpreting the DOD-STD-2167 literally and is producing excessive amounts of non-informative documentation."

Navy Response: Partially concur. The initial documents reviewed by IDA did indicate excessive, non-informative documentation was being produced. The Navy's implementation of DOD-STD-2167 has been heavily tailored, (as encouraged by the DOD Standard), to reduce the amounts and types of documentation required. The Navy is continuing to work with GE to further reduce program documentation to that necessary for efficient program management.

Issue: DOD 3405.2 requires use of Ada programming language unless waivers are granted. AN/BSY-2 use programming languages other than Ada. Are all required waivers granted?

Navy Response: Four different programming languages, in addition to Ada, have been used in the development of the AN/BSY-2. Two are required by the use of the EMSP which was mandated by Congress. They are:

- o ECOS - Used in the Enhanced Modular Signal Processor (EMSP) (SEM B Version),
- o CMS-2 - Used in the UYK-44 interface to the EMSP.

Waivers were requested in both cases but are not required since Ada was not available for the EMSP. The other programming languages being used are:

- o C programming Language - Used in the Database Management System to permit the use of commercial software, a specific exception allowed by DoD Directive 3405.2. A waiver has been granted.
- o Assembly Language - Used when Ada is too slow to meet requirements for system operation, a specific exception allowed by Navy TADSTAND C. A waiver is not required.

Issue: IDA study reported that GE is not using the Ada Program Design Language (PDL) for AN/BSY-2 software design.

Navy Response: Do not concur. General Electric is using the Ada PDL, as required by their contract with the Navy, and is requiring it's use by all subcontractors.

Issue: IDA study criticized the initial training program set up by GE for it's newly hired yet inexperienced Ada programmers.

Navy Response: Concur. GE's Ada training program was initially weak. Significant improvement has been achieved through the use of standardized training program among GE and it's subcontractors, mandatory lab work-shops, and frequently monitored testing. Independent testing by outside organizations places GE students in top third percentile of the programmer base. Ninety-seven percent of the required programming staff is in place.

Issue: IDA study states that "GE is modifying both the Ada compiler and the Ada run-time system." This raises the question of requirements to revalidate the compiler.

Navy Response: Partially concur. GE discovered a "bug" in the validated compiler which the manufacturer, VERDIX, corrected. VERDIX is revalidating their compiler and is contractually bound to provide updates of this compiler to GE. The AN/BSY-2 Program Office is closely monitoring all efforts in this regard to ensure full compliance with DoD requirements for Ada programs.

Issue: IDA study notes that GE planned to develop a library of re-usable Ada components to speed software development but GE had not yet specified their exact plan.

Navy Response: Do not concur. GE has a defined plan for a reusable software library. It is in accordance with required reference documents and was developed after studying previous efforts.

Issue: IDA study questioned the fact that NUSC is being used as both Independent Verification and Validation (IV&V) and Technical Direction Agent (TDA), doubting that NUSC can maintain the separation necessary to adequately perform it's role of IV&V.

Navy Response: Partially concur. The AN/BSY-2 Program Office is closely monitoring the ability of NUSC to perform it's duties of IV&V. The program manager has contracted with an independent firm (MITRE Corp.) to conduct appraisals of software development. Additionally, NUSC has hired additional personnel to strengthen their ability to fulfill this vital role. This area requires close attention and is receiving it.

Issue: AN/BSY-2 cost was reported as increasing by $140M between the end of 1988 and 1989.

Navy Response: Concur. $122M of the $140M was the result of changes due to inflationary indexes. The remainder was due to the Navy shifting all EMSPs to the SEM "E" version.

Senator KENNEDY. Senator Cohen.

Senator COHEN. Mr. Ferber, have you had any conversations with any of the GAO employees assigned to the House subcommittee investigating the DDG–51?

Mr. FERBER. The GAO employee? You mean Tim Morrison?

Senator COHEN. You have got 15 over there.

Mr. FERBER. As far as I know, the only GAO detailee who was working on this program is Tim Morrison.

Senator COHEN. Have you had any conversations with Mr. Morrison concerning his investigation as a House employee?

Mr. FERBER. Only to the extent he has called and asked me the status of our subpoena or status of the program. But no substantial comments.

Senator COHEN. So, in other words, none of his analysis has been given to you for GAO's purposes of preparing a report?

Mr. FERBER. No. None at all.

Senator COHEN. And you have seen none of the documentation that he might have been involved with?

Mr. FERBER. No. I do think that if you take a look at the staff level, that Tim Morrison is at the lower end of the staff who are working on this issue for Chairman Dingell. You have much higher level staff on the Chairman's committee who are working on this issue.

Senator COHEN. Have you ever seen a memorandum prepared for the Chairman by the subcommittee staff on the Navy's—on the DDG–51 program?

Mr. FERBER. I would have to see it to tell you. I do not know.

Senator COHEN. I will show it to you in just a moment. It is dated December 4, 1989, and it is entitled, "The Navy's Care and Feeding of Bath Iron Works on the DDG–51 Destroyer Program." Does that help you?

Mr. FERBER. I do not know if I have seen that or not. I think I know about it. Again, I think you have to draw a distinction that Tim Morrison—if you are trying to make a point about the GAO detailee—has not been substantially involved on this—I mean, he is working for people who are substantially involved in their investigation of the DDG–51. But he came on board after the allegations were made about mischarging and was not working on the issue, even in the fall when we briefed on the status of the program, per se. I think those are other staffers.

Senator COHEN. He started working when?

Mr. FERBER. I would have to get you the exact date, but it was late in the fall or early winter.

Senator **Cohen**. This is December of 1989. He is already on board by that time, right?

Mr. **Ferber**. But again, I do not think that he was substantially involved.

[Additional information follows:]

Mr. Morrison began working for the subcommittee on December 4, 1989, and was not involved in the December 4, 1989 memo being discussed.

Senator **Cohen**. Without focusing on Mr. Morrison specifically, I just want to know what the relationship is between GAO and the committees that are doing the investigation.

Mr. **Ferber**. Sure.

Senator **Cohen**. I want to know if you have had a chance to see this particular memo. I take it you have not?

Mr. **Ferber**. I cannot—I would have to look at it again.

Senator **Cohen**. Let me read to you a couple of pages here to see whether you think this is an appropriate characterization. On the first page, it talks about allegations of mischarges and it says, "It is not clear the Navy should be investigating these allegations, especially in view of the Navy's unhealthy interest in making life comfortable for this contractor at taxpayer expense."

Would that be your assessment of what the Navy has been engaged in with Bath Iron Works?

Mr. **Ferber**. No.

Senator **Cohen**. So you would dispute that characterization that the Navy has an unhealthy interest in making life comfortable for this particular——

Mr. **Ferber**. I would have no comment on that. I would not have assessed that.

Senator **Cohen**. I am looking at the program. I mean, did you find that to be the Navy's attitude?

Mr. **Ferber**. No.

Senator **Cohen**. All right.

"Just prior to the launch of the DDG-51 the Navy and Bath Iron Works issued disingenuous press releases and made misleading public statements to the press to counter your concerns." It is on page 2.

Mr. **Ferber**. I am sorry. Could you——

Senator **Cohen**. On page 2, first full paragraph, "Just prior to the launch the Navy and Bath issued disingenuous press releases and made misleading public statements."

Mr. **Ferber**. I do not recognize this memorandum.

Senator **Cohen**. "On September 16, the DDG-51 *Arleigh Burke* was launched to great fanfare in the Kennebec River, as you predicted," meaning as the Chairman predicted. Does that indicate to you that there is any kind of bias in terms of the characterization of the Navy's relationship with Bath Iron Works?

Mr. **Ferber**. Was it an issue of great fanfare? Yes, as launchings normally are.

Senator **Cohen**. As every launch is, is it not?

Mr. **Ferber**. That is correct.

Senator **Cohen**. Every launch is conducted with great fanfare, and yet launch of this ship is characterized in this memo as somehow being out of the ordinary.

On page 4, let me turn to the issue of stealthy characteristics. Does the GAO take the position that any attempt on the part of the Navy to introduce stealthy concepts or characteristics into surface ships is a laughing matter, uproariously a laughing matter? Does the GAO have any comment on that?

Mr. **Ferber**. No.

Senator **Cohen**. Have you made any analysis on the attempt by the Navy to introduce——

Mr. **Ferber**. No, we did not assess that aspect of the ship at all.

Senator **Cohen**. So you have made no assessment within GAO on whether that is a valid or an invalid concern on the part of the Navy, to reduce the radar cross-section of surface ships?

Mr. **Ferber**. I would personally have no objection to what the Navy is attempting to do.

Senator **Cohen**. I mean, is it a frivolous matter that they have under way?

Mr. **Ferber**. I would have no comment on that. I have not evaluated it.

Senator **Cohen**. Does anyone at the GAO have any assessment of that?

Mr. **Ferber**. The stealth characteristics on a destroyer, no.

Senator **Cohen**. Mr. Chairman, I am going to introduce this into the record along with several other documents to point out why Bath Iron Works has been reluctant to turn information over without some kind of assurance that they are not going to be hacked to death, or have their character diminished, or ridiculed on a piecemeal basis before the GAO completes its investigation.

[The material referred to follows:]

DEC- 6-89 WED 14:10 P.02

ONE HUNDRED FIRST CONGRESS

JOHN D. DINGELL, MICHIGAN, CHAIRMAN

GERRY SIKORSKI, MINNESOTA
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MICHAEL F. BARRETT, JR.
CHIEF COUNSEL/STAFF DIRECTOR

U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515

ROOM 2323
RAYBURN HOUSE OFFICE BUILDING
PHONE (202) 225-4441

MEMORANDUM

DATE: December 4, 1989

TO: The Honorable John D. Dingell, Chairman

FROM: Subcommittee Staff

RE: The Navy's Care and Feeding of Bath Iron Works on the DDG-51 Destroyer Program.

On September 12, 1989, you wrote to the Secretary of the Navy raising serious questions about the cost, schedule, design problems, and a number of contractual issues involving the "Arleigh Burke," the lead ship of the DDG-51 class guided missile destroyers being built by Bath Iron Works. The current estimate for the DDG-51 program is about $30 billion. We believe this to be seriously underestimated. You also raised questions about the financial stability of Bath Iron Works and an impending Navy bailout of Bath on the fixed price lead ship contract at a cost of about $85 million to the taxpayers. You asked that the Navy brief the Subcommittee staff on the status of the program.

In the course of the Subcommittee staff review, we have obtained information that the Navy has received and is investigating allegations that Bath Iron Works had mischarged or switched costs from fixed price contracts on both the DDG-51 destroyer and the CG-47 cruiser contracts to cost-plus service contracts at Bath. It is not clear that the Navy should be investigating these allegations especially in view of the Navy's unhealthy interest in making life comfortable for this contractor at taxpayer expense. The Office of Special Investigations at the General Accounting Office (GAO) has been asked by the Subcommittee to look into this matter. Intentional mischarging is a serious violation of law.

The facts that you cited in your letter were based on a nine-month review of the DDG-51 program by the General Accounting

Office. [Fact sheet attached.] As you know, the Maine delegation attacked the GAO for discussing its findings with the Oversight and Investigations Subcommittee prior to issuing its final report even though these briefings are a routine practice. However, such attacks could result in a watered down final GAO report.

Just prior to the launch of the DDG-51, the Navy and Bath Iron Works issued disingenuous press releases and made misleading public statements to the press attempting to counter your concerns claiming that: Bath Iron Works was not in financial trouble; no Navy bailout was contemplated; the severe cost and schedule problems were known to the Navy; Bath's substantial overruns would not increase the final cost of the DDG-51 "Arleigh Burke" because there would be cost savings elsewhere on this ship to offset the overrun at Bath; the cost of ships 6 through 10 would be reduced to about $600 million per ship -- less than half the cost of the DDG-51 at $1.3 billion; and the number of change orders was far fewer than the 760 that you cited.

On September 16, 1989, the DDG-51 "Arleigh Burke" was launched to great fanfare in the Kennebec River as you predicted.

However, in a preliminary staff review of the pre-launch claims of Bath Iron Works and the Navy, we have found those claims were outright untrue or, in certain cases, the Navy was unable to provide any written evidence to justify its claims. In fact, most of your charges and concerns have been found to have been significantly understated. For example:

-- Bath "bought in" on the DDG-51 contract in early 1985 for the survival of the shipyard -- counting on a bailout to get well. When the "buy in" issue was raised in 1985 after the contract was awarded, Navy Secretary John Lehman claimed in a taped interview (in the possession of the Subcommittee staff) that there would be no bailout -- the Bath owners or stockholders would have to eat the losses.

-- Bath seriously overran the DDG-51 contract with design and production costs at more than double the original contract costs. Bath was in serious financial trouble which jeopardized their ability to continue to perform under the contract. On July 31, 1989, Mr. William E. Haggett, Chairman and Chief Executive Officer of Bath, in a letter to the Navy warned "without these changes [bailout], the completion of the DDG-51 is in jeopardy and the impact on follow ship programs could be immense."

-- Despite Navy and Bath Iron Works' public representations just prior to the launching that a bailout was not being contemplated, we discovered the bailout (change order #760) was signed the day before the ship was launched on September 16, 1989. [Bailout documents are attached.]

-- The Bath Iron Works bailout alone will cost the taxpayers between $75-$90 million. This bailout will change the substantial projected loss at Bath of about $41.5 million to an estimated profit of $11.4 million.

-- The Navy admits they could not quantify the costs of either acceleration or "stealth," they merely negotiated with Bath on what they requested.

-- The GAO draft report on the DDG-51 program warned that this bailout could set an "inappropriate precedent of significant importance in Navy shipbuilding programs." There are currently a number of Navy shipbuilders with fixed price contracts who are losing money. This unusual bailout could have a massive ripple effect throughout the shipbuilding industry costing the taxpayers billions of dollars. For example, within weeks after the Bath bailout, the Navy and Litton (Ingalls) -- the follow-on yard on the DDG-51 program -- began discussions concerning significant change orders and the restructuring of its fixed price contract on DDG-52.

-- The Navy's legal and analytical contortions involved with justifying the Bath bailout are humorous. The Navy lawyers discuss the fact that they may have to use P.L. 85-804, the public bailout law used in the bailout of Lockheed, Chrysler and General Dynamics. However, they concluded that they could probably get away with using a change order -- which resulted in change order #760. The Navy lawyers, with questionable confidence, concluded that this method of bailout is "admittedly highly unusual," but "is not impermissible." [The Navy's legal analysis is attached.]

-- On September 7, 1989, the Navy received allegations of serious fraudulent mischarging by Bath on the DDG-51 contract. On September 14, 1989, the Navy accepted Bath's certification of cost and pricing data that was the basis of the bailout while waiving the requirement for a Defense Contract Audit Agency (DCAA) audit of this data. On September 15, 1989, the Navy approved between $75-$90 million bailout of Bath.

-- As you know, claims of "stealth" characteristics for major weapons systems were the cachet of the early 1980s. There was a requirement in the original DDG-51 contract to make this class of destroyer "stealthy." Most experts laugh uproariously when asked whether it makes sense to attempt to make a 8,315 ton all-steel ship equipped with the super sophisticated AEGIS air defense system "stealthy." A Subcommittee staff review of the Navy and Bath Iron Works documents justifying the numerous schedule slippages up through early 1989 never mentioned a problem with the design, engineering or production of the "stealth" requirement to justify meeting contractual schedules. Suddenly, in the late spring and early summer of 1989 -- over four years into the contract and two years into production -- the "stealth" requirement became an overwhelming design, engineering and production problem and is one of the major bases for the bailout -- accounting for more than $30 million. According to Navy officials, this money was not required because of changes in the scope of the work, but was given to Bath because the Navy felt they had Bath in an "inequitable position." However, they could not cite a single example where a defense contractor has returned money to the government because the government was in a similar inequitable position. Despite the fact that the requirement was in the original contract, happily signed by Bath Iron Works in March 1985.

- According to radar experts we have consulted, nothing can be done to reduce this ship's radar signature enough to make any practical difference in the range at which it would be detected by an airborne radar. This is a very large (8,315 tons loaded) steel ship. According to experts, an airborne radar at an altitude of 50,000 feet would detect it easily at over 300 miles. A much more serious problem is the large number of anti-radiation missiles (ARMs) the Soviets have produced in many models. Indeed, the first Soviet anti-ship missile (1959) was an ARM. On November 14, 1989, the Defense Intelligence Agency (DIA) and the Central Intelligence Agency (CIA) released a report on this subject entitled "Special Assessment on the Antiradiation Missile Threat". The report is SECRET. The situation is far grimmer than anyone without very special security clearances would have guessed. Some ARM missiles are air-launched, others are ship or submarine-launched. The only way the CG-47 cruisers or DDG-51 destroyers can avoid being seriously damaged or sunk is to turn off the radar. The obvious question then is, "Why spend over $1 billion on a ship if we have to turn off its radar in combat?" This CIA/DIA report is a splendid piece of work and should be required reading for anyone contemplating putting more money into the CG-47 and DDG-51 programs. It should also be required reading for advocates of the F-14, F-15, F-16, F-18, AWACS, PATRIOT, J-STARS and all our other costly systems that have been rendered potentially obsolete by this family of relatively simple Soviet missiles.

-- At least the Navy has provided comic relief concerning the "stealthy" DDG-51. The Navy warned the Subcommittee staff that the code name for the "stealth" program on the "Arleigh Burke," combined with the fact that it means "stealth," has been classified "SECRET" -- an extraordinarily high classification. However, the code name by itself is not "SECRET" nor is the "stealth" requirement "SECRET." Unfortunately, both are mentioned in several Navy documents merely stamped "Official Use Only," "Attorney-Client Privilege" or "Business Sensitive". However, if one mentions that "code name" means "stealth," he could very well be prosecuted. Who is attempting to hide what from whom?

-- Another rationalization for the Navy's bailout is to pay Bath Iron Works millions for acceleration of the shipbuilding program. It appears this acceleration is an effort to show progress in order to protect the budget of the DDG-51 program in the Congress. As the GAO pointed out, both the Navy and Bath Iron Works are having serious design problems with the ship. There are still hundreds of change orders under consideration or held in abeyance for future ships. Major changes are already being made in the helicopter capability of the DDG-52. The schedule for delivering a completed combatant to the Navy has already slipped 18 months. The GAO has also discovered some problems with the combat systems. The Navy has already allowed Bath to slip the schedule of their second destroyer, DDG-53. It is not at all clear why the Navy needs this ship in a hurry, particularly in the current atmosphere. Why should the taxpayers foot the bill for acceleration? Isn't this merely a scam for slipping taxpayers' money to the contractor? At the present schedule, the Navy may have about 17 of these destroyers, or over 50 percent of the program, under construction or contract before the first sea trial testing is complete.

-- Despite claims to the contrary, Bath Iron Works, according to Navy documents, has had serious financial problems that could jeopardize the company's survival as well as its performance on the DDG-51 contract. Bath Iron Works had been laboring under the burden of excessive capital costs due to its being a victim of a leveraged buyout. It is currently a wholly-owned subsidiary of the Bath Holding Corporation, with Bath Iron Works being the sole operating company. This buyout was completed on August 21, 1986. The Bath Holding Corporation is owned by the Prudential Insurance Company of America and Fulcrum II, a New York limited partnership. In the last year, Bath Iron Works has had serious cash deficiencies. In November 1988, the Navy hired the accounting firm of Peat, Marwick to audit Bath's financial records and condition. [The report is attached.] In December 1988, prior to awarding three additional destroyer contracts to Bath, the Navy was assured that Prudential promised a substantial equity injection and that Bath Iron Works' banks would extend the amount and terms of its line of credit. Based on these assurances, the Navy awarded three more destroyer contracts to Bath in December 1988. The Navy could provide no documents to indicate whether this financial restructuring and the infusion of money actually took place. The Navy informed the Subcommittee staff that it did no financial analysis prior to the bailout in September 1989. However, Navy Captain Gene Harshberger, who is responsible for Navy contracting, told the Subcommittee staff in an interview that he could not have suggested any further contract awards to Bath Iron Works unless the company was bailed out by restructuring the DDG-51 fixed price incentive contract.

-- Contrary to Navy claims, there have been 760 change orders proposed by both Bath and the Navy. Change order #760 was the bailout. Two hundred and eighty change orders have been negotiated and costed out. Hundreds of change orders are either under consideration or are being held in abeyance by the Navy as changes to follow-on ships.

-- Despite serious problems with the design, delivery of drawings, five or six schedule slippages totaling 18 months, 120 percent overrun on the design contract, and a 60 percent overrun on the production contract, the Navy awarded Bath $14 million or about 90 percent of their incentive payments for excellent performance under the fixed price incentive contract.

-- The Navy claimed that we should not be concerned about the $1.3 billion price of the "Arleigh Burke" because ships 6 through 10 will only cost around $600 million per copy. This claim is bizarre. The Navy and the Office of the Secretary of Defense have informed the staff that the AEGIS air defense system alone costs between $600-$700 million per copy depending on the configuration. The Navy seems to be suggesting that Bath would pay the government around $100 million for the pleasure of building each new hull. The Navy could produce no analysis created prior to the launch on September 16th to back up this strange claim.

-- The Navy also claims that the Bath Iron Works overruns and bailout will not increase the $1.2 billion budgeted price of this ship because these cost increases would be offset by savings on other systems on this ship. Again, the Navy could produce no original analysis done prior to the statement it made the day before the launch to back up this claim.

Attachments

GAO
United States
General Accounting Office
Washington, D.C. 20548

Comptroller General
of the United States

September 27, 1989

The Honorable William S. Cohen
United States Senate

Dear Senator Cohen:

I have received your September 21, 1989, letter expressing concern about public accounts based on information from an ongoing GAO study of the DDG-51. We share your concerns when information GAO is developing is prematurely leaked to the media or is used out of context.

I will respond to each of the questions you asked in your letter, but first let me say that the information we provided to Chairman Dingell's staff in a short briefing was accurate. Also, as is our policy, we told his staff that the information was still preliminary and that we were in the process of preparing a detailed draft report to be provided to the Department of Defense (DOD) for formal comment.

Your first question asked about our policy regarding the release of information related to an ongoing study prior to providing an opportunity for DOD to comment. We frequently are asked by congressional staffs to brief them on the progress and preliminary results of our work. It is our policy to respond to such requests whenever we can, noting the preliminary nature of the information. On the DDG-51 we provided Chairman Dingell's staff background and factual information. Similarly, earlier this year we provided briefings on the DDG-51 to staff of both the Senate and House Committees on Armed Services and Appropriations. Also, on July 10, 1989, staff from our Boston office shared preliminary information with Bath's Chief Executive Officer. We subsequently arranged to have a formal exit conference with Bath.

Secondly, you asked who in GAO was involved in the study and who was responsible for authorizing release of the information to Chairman Dingell's staff. The study is being done under the direction of our National Security and International Affairs Division. The work is primarily being carried out by our Boston staff at Bath Iron works. Our Director for Navy Issues authorized and participated in the briefing of Chairman Dingell's staff. He was accompanied by his Assistant

Director responsible for the study and our Office of Congressional Relations staff. As I mentioned earlier, briefing congressional staff is a frequent activity and is one of the ways we are responsive to the needs of the Congress.

You asked about our safeguards that the information briefed was accurate and timely. The information included in our briefing came from a draft report that was under review by our Director for Navy Issues. While the information was factual, Chairman Dingell in his letter to the Secretary of the Navy used the phrase 760 change "orders" whereas our briefing showed these as change "proposals" -- the Navy and Bath have agreed on less than 300 change orders with 50 more still under consideration. Chairman Dingell also said that the DDG-51 was 38 percent complete at launching in September whereas we said the ship was 38 percent complete in June. Bath says the ship was about 47 percent complete at launching.

You also asked whether the information briefed was proprietary or business sensitive. The only potentially sensitive data might be Bath's potential loss on the DDG-51 contract and the pending engineering change proposal. Although we recognize others could reach a different conclusion, it was our judgement that the information was not sensitive. Ordinarily, contractors inform us when any information is considered sensitive. However, we discussed this information with Bath and it was not characterized as being sensitive. Had we considered any of the data sensitive we would have still briefed it; however, we would have told Chairman Dingell's staff about its sensitivity. In any event, we did tell his staff that all the data were preliminary and not for release.

Lastly, you asked what steps we will take to correct misinformation publicized by the premature release of the data we briefed. Our Director for Navy Issues received several calls from the media who had been provided information by Chairman Dingell's staff. He responded that he was not in a position to comment because our study was still in process. However, because the media had the data we briefed, he strived to make sure it was correctly interpreted. For example, he provided the reporters with copies of our August 4, 1989, report entitled Status of Cost Growth and Claims on Shipbuilding Contracts, which discusses all shipbuilding overruns on fixed-price incentive contracts, because he wanted them to be able to put the DDG-51 in perspective.

I trust this adequately responds to your concerns and explains GAO's policy in matters such as these. I would be happy to meet with you to discuss this further. We are sending similar letters to other members of the Maine Delegation.

Sincerely yours,

Charles A. Bowsher

Charles Bowsher
Comptroller General
of the United States

WILLIAM S. COHEN
MAINE

United States Senate
WASHINGTON, DC 20510-1901

May 10, 1990

Mr. Milton J. Socolar
Special Assistant to the Comptroller General
General Accounting Office
441 G Street, NW
Washington, D.C. 20548

Dear Mr. Socolar:

Press articles in the last few days quote a Congressional subcommittee's letter to Defense Secretary Cheney that states: "According to GAO, Bath (Bath Iron Works) has refused to allow GAO investigators to interview Bath employees and has also refused to provide copies of relevant documents unless GAO pledges to withhold this information from the Congress."

This statement suggests that BIW officials are engaged not only in obstructing GAO's investigation of hotline allegations of mischarging, but are also intent on preventing Congress from ever learning the results of such an investigation.

I have a copy of a letter William Haggett, Chairman and CEO of Bath Iron Works, sent you early last week in which Mr. Haggett expresses regret that the same Congressional subcommittee has now torpedoed successive tentative agreements reached between GAO and BIW over the last four months that would have, except for the subsequent Congressional intervention, allowed GAO's investigation at Bath to proceed without delay.

Mr. Haggett asserts that the only stipulation contained in the last agreement which would limit GAO behavior was that no interim or selective accounts of the investigation's findings were to be provided outside GAO, except to the Justice Department if appropriate, until the investigation was completed. I understand that this stipulation was rejected by the Congressional subcommittee. No restrictions were imposed on GAO access to BIW employees or applicable documents. No BIW official or corporate counsel was to observe or participate in on-site interviews of BIW employees by GAO.

It is my understanding that this agreement would have allowed GAO personnel to conduct its investigation in an effective and thorough manner. The only restriction I have been made aware of is related to the release of interim information prior to the conclusion of the investigation, not to the actual conduct of the investigation itself. I further understand that BIW put no restrictions on release of the findings of a completed investigation.

Lastly, I understand that the first tentative agreement was apparently reached last February. That means GAO's investigation, except for delays due to Congressional intervention, could have been completed this month, and its finding already provided to Congress.

I would appreciate knowing whether I have been misinformed about this matter.

I look forward to hearing from you.

Sincerely,

William S. Cohen
United States Senator

WSC:dfg

**Comptroller General
of the United States**

Washington, D.C. 20548

May 16, 1990

The Honorable William S. Cohen
United States Senate

Dear Senator Cohen:

This is in response to your May 10, 1990, letter pertaining to our access to contract records at Bath Iron Works in connection with our review of allegations of mischarging by Bath on its cruiser and destroyer contracts with the U.S. Navy. Our Office's authority for access to the records in issue is set out in a clause in Bath's contracts with the Navy, as required by law; the clause entitles the Comptroller General to examine any books, documents, papers or other contractor records that directly pertain to, and involve transactions relating to, the contract.

The facts as portrayed in your letter are substantially correct. Bath has proposed to provide us records and access to its employees on the condition that we not release interim information to "outside sources," by which Bath means the Congress, before completing our investigation, unless we uncover evidence of criminal misconduct, which we would turn over to the Department of Justice.

As you are aware, however, our Office generally is obligated to provide briefings and information to Members of Congress at their request. The Chairman, Subcommittee on Oversight and Investigations, House Committee on Energy and Commerce, who requested our investigation, has not agreed to Bath's proposal on the basis that no contractor should be permitted to place conditions on GAO's statutory right to examine its records.

Sincerely yours,

Milton J. Socolar

Milton J. Socolar
Special Assistant to the
Comptroller General

cc: Chairman, Subcommittee on Oversight
and Investigations, House Committee
on Energy and Commerce

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON DC 20362 5101

IN REPLY REFER TO
4200
Ser 02/761
7 December 1989

Mr. W. Haggett, Chief Executive Officer
Bath Iron Works Corporation
700 Washington Street
Bath, Maine 04530

Dear Mr. Haggett:

As we discussed this morning, in connection with a review of the DDG-51 contract, the Chairman of the House Subcommittee on Oversight and Investigations requested the Navy to provide documents to his staff. Included was a request for documents involved in analysis of the financial integrity of Bath prior to award of the FY 1989 DDG's. The requested documents were provided with markings indicating official use only and business sensitive.

I understand that these documents have now been released outside the Government. I have concluded that it is appropriate to provide these documents to your company. No further disclosure outside the Government is planned by the Navy.

E. B. HARSHBARGER
Captain, SC, USN
Deputy Commander for Contracts

Attachment

Navy documents on BIW cost data and financial condition provided to Chairman, House Oversight and Investigation Subcommittee, Energy and Commerce Committee subsequently provided to press.

Two-page December 12, 1988 NAVSEA Financial Review of Bath Iron Works Corporation signed by Frank Radocha, NAVSEA Contracting Officer. (stamped on every page For Official Use Only and Business Sensitive.) Enclosures (seven pages) attached to Dec 12 NAVSEA memo entitled Key Financial Indicators for Bath Holding Corporation signed by Ann Carey, Procurement Analyst, NAVSEA, December 1, 1988. (stamped on every page Official Use Only and Business Sensitive.)

Nine-page NAVSEA legal analysis subj: BIW request for contract restructuring incident to ECP 760, signed by S. Scott Garner, Associate Counsel, NAVSEA, dated August 24, 1989 (stamped on every page For Official Use Only, Business Sensitive, and Attorney Work Product-Attorney Client Privilege.)

First two items forwarded to BIW Dec 7, 1989 attached to letter from Capt. E.B. Harshbarger, Deputy NAVSEA Commander for Contracts. Capt. Harshbarger's letter to BIW reads in part: "In connection with a review of the DDG-51 contract, the Chairman of the House Subcommittee on Oversight and Investigation requested the Navy to provide documents to his staff. Included was a request for documents involved in analysis of the financial integrity of Bath prior to award of the FY'89 DDG's. The requested documents were provided with markings indicating official use only and business sensitive. I understand that these documents have now been released outside the Government."

Legal Analysis faxed to BIW by reporter calling December 5th in reference to it and other documents listed above which were already in the press' possession and had been provided according to several reporters by staff of the Oversight Subcommittee. December 7, 1989 Boston Globe front page article on Rep. Dingell's charges against the DDG-51 program quoted extensively from many of these restricted documents.

Senator COHEN. I think all of us want to see GAO act as an independent arm of the Congress, but not to see it used by any given individual in order to achieve a particular end. All of us are interested in eliminating fraud and waste, and if Bath Iron Works or anyone else is engaged in fraud or misuse of taxpayer dollars, we want to see them dealt with as severely as anyone else.

But I must say I want to take this opportunity once again to raise concerns over the way in which they are being treated. And now there is the threat that the GAO is going to issue a subpoena, when, in fact Bath has tried to comply, at the same time is saying, "Please give us some measure of protection here against a premature release of allegations which may or may not have any validity."

Mr. Ferber, I will let you know that this committee and the Governmental Affairs Committee, in which I have served, have used GAO over my years in the Senate with great success, I would say. I am simply concerned about the process being distorted in a way that does damage to individuals without giving them any real chance for recourse.

I do not like to see the GAO put in a position of saying, "This contractor is not cooperating with us." Every indication I have had is that there have been four agreements, the last one was initiated by GAO, which have been satisfactory to GAO, but they were then vetoed by a House member. And now the characterization is made that BIW is not being cooperative. I do not think that is a fair characterization.

This is again, not directed toward you, but to the process itself.

Thank you, Mr. Chairman.

Senator KENNEDY. You know, it is really up to a committee chairman. If the chairmen want to get subpoenas, they can get subpoenas. That course of action is available to the committees. Of course, they have to be able to make the representation to the committees and be able to get the support for that.

I think the point that Senator Cohen is making is that in terms of the GAO's investigation feeling they can get satisfactory response on something and then a member wants some other material, we certainly have in our committees the power to move ahead. They are not getting it, and usually if you have got the case to be able to make it, that is the way you go.

Mr. FERBER. I just hope the Chairman and Mr. Cohen appreciate that we might be caught in a little dilemma here. Statutorily and legally, we have a right to those documents, and that is what we are pursuing. We cannot, albeit how we understand Bath's position, we cannot provide the assurance that they are asking. That comes from the Congress, not from us.

Senator COHEN. I understand that completely, believe me. I understand that you have an obligation to get information. Bath Iron Works wants to fully comply. My only concern is that it is not GAO that wants the information in such a form. GAO apparently had reached an agreement that would have allowed all of this information to be presented to the Congress in full by this date. And yet it has been delayed, because of the past release of information, in a way that has either ridiculed or diminished or in fact launched allegations against Bath Iron Works, which I think are unfair, until the investigation is complete.

So here we have a situation where GAO appears to be satisfied that they can get the information. But then you are told by a committee chairman or his staff, "No, we want to do it a different way; we want the information now." Since you do not have any control over the release of it, Bath is caught in the middle.

And I just think that when BIW is characterized as being uncooperative, then it looks like they are trying to hide something, when, in fact, they are prepared to cooperate fully if there is only some cooperation, some agreement that everybody hold the information until the investigation is done, which is all any of us can ask for.

Senator KENNEDY. Thank you very much.

We will have Gerald Cann, who is Assistant Secretary of the Navy, for Research, Development and Acquisition; Vice Admiral Dan Cooper, Assistant Chief of Naval Operations for Undersea Warfare; Vice Adm. Peter Hekman, who is the Commander of the Naval Systems Command; and Vice Adm. John Nyquist, who is the Assistant Chief of Naval Operations for Surface Warfare.

STATEMENT OF GERALD A. CANN, ASSISTANT SECRETARY OF THE NAVY FOR RESEARCH, DEVELOPMENT AND ACQUISITION

Mr. CANN. Mr. Chairman and distinguished members of the committee, I am pleased to be here as the Navy's first Assistant Secretary for Research, Development and Acquisition. In the interest of getting on with what I think are the major issues that you want to discuss, I am going to submit my statement for the record.

I would like to make a couple of points that I think will help set the stage for what we are about to discuss.

First of all, with respect to this whole discussion that is going on about forces, force levels and different types of ships—the DDG-51, the SSN-21, the carrier force and so forth—I think that one of the important points that has to be made is, what ever ships we have in the fleet, then those are the ones we go to war with, if we have to go to war.

Now, we have a considerably different situation than we had in World War II, when we ended up with over 5,000 active ships in the fleet. The ships that we built during World War II were essentially boxes with independent gun systems and independent systems mounted on the top or mounted in them and were considerably simpler to build. As I remember as a child, we were putting out liberty ships for sealift at a rate of one a day during World War II.

So, it is a completely different issue than we have today. In order to get the kind of subsystems into the ships and submarines that we are talking about today and integrate them, takes considerable amount of time, in addition to the time it takes to develop these subsystems.

I would like to point out that there has been a lot of discussion about various aspects of the ship building industry, and the vendor base and shipyards to support the war ship construction in this country. Essentially they have a single customer, which is the U.S.

Navy. And if we are going to have this kind of capability in the future, we have got to support those kinds of activities. Therefore, discussions regarding skipped years and delayed productions are going to result in lost vendors. We can discuss those lost vendors, especially in the submarine world, at great length. Also, there is a potential for higher cost if you do that.

Now, I would like to point out before we get started that all of these issues are under intense review in the Pentagon at the present time, as a function of three activities: the warship review that is ongoing for the SSN-21 and for the DDG-51 are covering about every conceivable aspect of those two programs you can think about. And, of course, the summer review of the POM in preparation for the 1992 budget is also looking carefully at the entire question of the force levels.

Now I would just like to make a couple of other minor points. There has been a lot of discussion about the threat. I am certainly not one to sit here and try to understand what is happening around the world in some detail, but the evidence with respect to building is still with us. The Soviets fielded nine new submarines in 1989, which included four KILOs, two SSBNs and three SSNs. In 1990, there is an estimate of more submarines. That may be that they do not plan to use them, but the point is that they are available. I think that the reason that we have been so successful over the last 40 years is that we have built, without question, the best fleet in the world.

With respect to things that are of issue right now, our carrier force is a unique force in this world. Nobody else has a carrier force like we have. It has been eminently successful in carrying out national policy. Furthermore, our submarines have historically been so good that we have had a great deal of difficulty getting a new class of submarines started. The SSN-688 class was started back in the 1960s, went into production in the 1970s, and has carried us all the way through to the 1990s, and is going to be in the fleet into the year 2000.

Certainly, our destroyer classes, with the advent of the Aegis weapon system, have given us a new dimension in terms of being able to give ourselves protection at sea from aircraft and missiles.

I would just like to remind everybody that these issues are very complex. It is not a question of turn it on or turn it off. We have to make conscious decisions about what we are going to do. My concern about this is that I am the one that has to produce these systems. I have to worry about the development of the subsystems that go in these ships, and I have to worry about the health of the industrial base to support it, both for subsystems and for the ships that are going to receive them eventually.

Also, I am prepared to discuss, in some length, the concurrency issues that have been raised. Before I get into that, Admiral Cooper and Admiral Nyquist have very short comments they would like to make. They represent the requirements community for the Navy, and I would like to give them a chance to make a couple of comments.

[The prepared statement of Mr. Cann follows:]

HONORABLE GERALD A. CANN
Assistant Secretary of the Navy
for Research, Development and Acquisition

On 12 March 1990, the Honorable Gerald A. Cann was sworn in as the first Assistant Secretary of the Navy for Research, Development, and Acquisition. He is responsible for all acquisition policy and procedure and all research, development, production, shipbuilding, and logistics support programs within the Department of the Navy.

Mr. Cann graduated from New York University in 1953 with a Bachelor of Science degree in Geology/Geophysics. He served two years in the US Army Signal Corps before joining the American Machine and Foundry Company where he served as TITAN I Test Manager. and as Deputy Engineering Manager for the TITAN I Division.

In 1965, Mr. Cann joined TRW Systems, Inc. where he specialized in providing analyses and consulting services to the US Navy on anti-submarine (ASW) systems.

In 1970, Mr. Cann joined the Office of the Secretary of Defense as Staff Assistant for Ocean Surveillance and subsequently served as the Assistant Director for Ocean Control.

In 1977, Mr. Cann was assigned to the staff of the Secretary of the Navy as the Deputy Assistant for Systems. From 1979 through 1985, Mr. Cann served as the Principal Deputy Assistant Secretary of the Navy (Research, Engineering, and Systems) where he assisted the Assistant Secretary on all matters pertaining to Navy and Marine Corps research, development, test, and evaluation.

For the next two years, Mr. Cann established a private consulting firm and provided advice on long-range planning, allocations of independent research and development funds, congressional strategy, and teaming philosophy. His firm also specialized in the technical support for anti-submarine warfare, undersea, and air defense programs. Immediately preceding his appointment as the Assistant Secretary of the Navy, Mr. Cann served as the Vice President of the Undersea Warfare Center, General Dynamics Corporation.

Mr. Cann has been active in numerous committees sponsored by both government and industry, including the Defense Science Board, Naval Research Advisory Committee, National Academy of Sciences, Chief of Naval Operations Executive Panel, and the American Defense Preparedness Association.

During his career in both government and private sectors, Mr. Cann has been recognized through the award of the Defense Meritorious Service Medal, the Navy Distinguished Civilian Service Medal, and the National Security Industrial Association Charles Weakley Award, and most recently, the Navy Meritorious Public Service Award. In 1980, he was presented with the Distinguished Executive Award by the President of the United States.

Good morning Mr. Chairman, and distinguished members of the Subcommittee. I appreciate this opportunity to appear before you and discuss Navy Shipbuilding. To assist me in answering your requirements related questions, I have with me VADM John W. Nyquist, Assistant Chief of Naval Operations (Surface Warfare), VADM Daniel L. Cooper, Assistant Chief of Naval Operations (Undersea Warfare), and VADM Peter M. Hekman, Jr., Commander Naval Sea Systems Command.

FY 1991 BUDGET SUMMARY

The Navy's budget request for FY 1991 Ship Construction is $11,195.2 Million. This represents resources for 15 new ships and 22 craft. The budget request for the FY 1991 Ship Maintenance and Modernization is $3,531.5M. This is for 13 overhauls, 90 SRA's and 45 PMA's. In order to ensure that we retain optimum seapower projection capability in the current constrained budget environment, it is extremely important to not only acquire new ships but also to keep existing fleet assets in the best possible condition, with the most modern weapon systems A list of these ships and craft and detailed descriptions of our programs are contained in our budget justification material which you have already received.

Naval Shipbuilding

Currently, 103 Navy ships, consisting of 95 new construction, 7 conversions, and 1 SLEP (at a public yard), are under contract or construction. These ship construction programs and quantities are listed in the attached Table. During FY 1989, 20 new ships, 2 converted ships, and 1 activated ship were delivered. In FY 1990, 15 new ships and 1 conversion are scheduled for delivery. Of these, 8 new construction ships have been delivered.

TRIDENT Submarine

The 17th OHIO Class TRIDENT submarine, SSBN 742, was awarded to the Electric Boat Division of General Dynamics in October 1989. Currently, eight C-4 missile capable and two D-5 missile capable OHIO Class submarines have been delivered. The next ship, USS WEST VIRGINIA (SSBN 736), is scheduled to be delivered in September 1990.

SSN 688 Class Attack Submarine

The FY 1990 budget appropriated one SSN 688, which represents the last of the SSN 688 program. Through FY 1990, 62 SSN 688 Class submarines have been authorized, of which 43 have been delivered. The remaining 19 are planned for delivery by 1995. Under competitive procurement strategies, General Dynamics Electric Boat Division (EBDIV) has been awarded 33 submarines while Newport News Shipbuilding (NNS) has been awarded 29.

Since the first SSN 688 submarine construction contract was awarded in 1971, continual improvements in war-fighting capabilities have been incorporated resulting in the recently awarded submarines having dramatically greater war-fighting capabilities, including propulsion improvements, combat system upgrades and weapon delivery capabilities, when compared with the first submarines of the class. However, the capability to make the magnitude of improvement required to match the projected threat in the 21st century is not available, this necessitates the building of the SEAWOLF class.

SSN 21 SEAWOLF Class Attack Submarine

The SSN 21 SEAWOLF Class submarine is designed to counter the rapidly increasing capabilities of the Soviet submarine force projected for the late 1990s and beyond. SEAWOLF will be the world's foremost submarine: quiet, fast, and well-armed with advanced sensors, capable of deploying to forward ocean areas to search out and destroy enemy submarines and surface ships and to attack land targets.

The SEAWOLF program is over 7 years into a 13-year process toward delivery of the first ship. NNS is the lead yard for detail design. EBDIV is the propulsion plant design yard as well as being a major subcontractor to Newport News Shipbuilding for detail design. A contract for construction of the lead ship was competitively awarded to EBDIV in January 1989. Construction has begun. As requested in the conference report for the FY 1990 Appropriation Bill, we have requested a reprogramming to correct identified cost growth for the SEAWOLF. The cost growth is attributed to unanticipated labor rate escalation and material cost increases. It is absolutely vital that the requested funding be provided as quickly as possible to preclude costly lead ship construction delays and to fund lead ship obligations which were delayed.

Nuclear-Powered Aircraft Carrier Construction

USS ABRAHAM LINCOLN (CVN 72) was delivered in October 1989 two months in advance of contract delivery. Construction of GEORGE WASHINGTON (CVN 73) continues on schedule toward a July 1992 delivery.

The FY 1988 Appropriation Act included funding for two NIMITZ Class aircraft carriers: CVNs 74 and 75. A construction contract with Newport News Shipbuilding for CVNs 74 and 75 was executed in June 1988, with projected delivery dates of December 1995 and June 1998, respectively.

CG 47 Class Cruisers

The first ship of the class, USS TICONDEROGA, was appropriated in FY 1978 and was commissioned in January 1983. The last 5 ships of the 27-ship class (CGs 69-73) were appropriated in FY 1988. The final ship of the class is scheduled to complete in 1994.

Fifteen AEGIS cruisers have been commissioned to date. They are the worlds most capable AAW and ASW surface combatants and have operated successfully in all environments and in every ocean area in a variety of employments.

DDG 51 Class Destroyers

ARLEIGH BURKE (DDG 51) is the first ship of the second class of AEGIS warships authorized by Congress and currently under construction. DDG 51 is a multi-mission AEGIS-equipped Guided Missile Destroyer whose mission requirements are to project power simultaneously in the four dimensions of Naval Warfare: Anti-Air, Strike, Anti-Submarine, and Anti-Surface. AEGIS-equipped DDG 51 Class ships will complement the CG 47 Class cruisers as part of the Carrier Battle Groups. The DDG 51 Class will also operate with Surface Action Groups, will deploy in support of Replenishment and Amphibious Groups, and be capable of independent operations.

The Navy's greatest ship inventory shortfall is in the area of battle force combatants; a shortfall exacerbated by the accelerated retirement of the DDG 2 and DDG 37 Classes, as well as the approaching retirement of aging conventional cruisers. The DDG 51 Class fulfills the need for battle force combatants while providing quantum improvements in war fighting and survivability over the ships this class replaces. Thirteen ships are under contract with Bath Iron Works and Ingalls Shipbuilding. A minimum of five ships per year is considered necessary to keep pace with retirements of older AAW destroyers and to maintain cost effective ship construction.

Last year, Congress approved a multi-year procurement strategy for 10 DDG 51 destroyers 5 each in FY 1990 and FY 1991. Our submission this year requests funding for five FY 1991 ships. The acquisition cost estimate for these five ships was reduced by a total of $125 million assuming a multi-year procurement would be executed. Based upon lack of demonstrated savings after receipt of the FY 1990 contract proposals, these 10 ships will be procured in two separate annual procurements. We are evaluating the impact of this decision.

LSD 41 Class Landing Ship Dock

LSD 41 Class ships are major components in our modernized marine amphibious capability. Of the eight LSD 41 Class ships awarded, four are in service and the remainder are in various stages of construction at Avondale Industries. Scheduled deliveries for the remaining ships continue through early 1991.

A contract for detail design and construction of LSD 49, the first of the Cargo Variant LSD(CV) ships, was competitively awarded to Avondale Industries in June 1988, with delivery scheduled for November 1993. This ship incorporates the same hull and propulsion plant as the first eight ships but includes interior arrangements which increase cargo capacity. The contract includes pre-priced options for four additional ships. The Navy exercised the option for LSD 50 in December 1989.

LHD 1 Class Amphibious Assault Ship

LHD 1 Class ships are the dominant component in our modernized Marine Corps amphibious assault capability. Construction of the LHD 1 Class continues at Ingalls Shipbuilding. USS WASP (LHD 1) was delivered in May 1989, with deliveries of LHDs 2, 3, and 4 scheduled for April 1992, January 1993, and March 1994, respectively, all from Ingalls. The Navy plans to competitively procure LHD 5 and follow-on ships. Advance procurement funding for this ship was provided in FY 1990. Contract award for construction of LHD 5 is planned in FY 1991.

Landing Craft, Air Cushion (LCAC)

As of March 1990, 20 LCACs have been delivered and they are operating very successfully. FY 1990 contracts were awarded to Textron Marine Systems (TMS) (9 craft), and Avondale Gulf Marine (AGM) (3 craft). TMS acts as the Central Procurement Activity for major LCAC components. A promising demonstration of the capability of the LCAC to deploy, tow, and recover mine countermeasures equipment was successfully completed in June 1988. The FY 1988 SCN Appropriation provided $2.8 million for design of arctic-configured LCACs. We are currently reviewing improvements that enhance arctic capability.

MCM 1 Class Mine Countermeasures Ship

This is a 14-ship program for ocean-going minesweepers. USS AVENGER (MCM 1) has completed post-delivery testing and is an active fleet unit. Eight ships remain under contract with Peterson Builders, Inc., and two remain under contract with Marinette Marine Corporation. Three ships were delivered in CY 1989, and three more should be delivered in CY 1990. The new and very capable AN/SQQ-32 minehunting sonar has been installed in USS AVENGER.

MHC 51 Class Coastal Minehunter

This is a planned 17-ship program for glass reinforced plastic (GRP) coastal minehunters. The design is based on Italian GRP technology which was transferred to the lead shipbuilder (Intermarine USA, Savannah, Georgia) and is being transferred to the second source shipbuilder (Avondale Industries of New Orleans, Louisiana). Lead ship delivery is scheduled for January 1992. Three ships have been awarded; two to Intermarine and one to Avondale. These contractors will compete for the remaining 14 ships of the class.

AOE 6 Class Fast Combat Support Ship

The lead ship contract awarded to National Steel and Shipbuilding Company (NASSCO), San Diego, California, in January 1987 included options for three additional ships, one each in FY 1989, FY 1990 and FY 1991. With exercise of the option for the FY 1990 ship in December 1989, three ships are now under contract. We expect delivery for the lead ship in July 1991.

T-AO 187 Class Fleet Oiler

All seven ships of the third and final flight of Fleet Oilers have now been awarded to Avondale Industries. Two of the four second flight ships awarded to Pennsylvania Shipbuilding (Penn Ship) but not then begun, were assigned by Penn Ship to Avondale in June 1988. In August 1989, the Navy terminated the contract with Penn Ship and subsequently contracted with Tampa Shipyards, Inc. (Tampa Ship) for completion of the work on the remaining two ships.

T-AGOS 19 Class Ocean Surveillance Ship

In October 1986, the Navy awarded McDermott Shipbuilding, Morgan City, Louisiana, a contract for the detail design and construction of a T-AGOS SWATH (Small Waterplane Area Twin Hull). An option for three FY 1989 follow-on ships was exercised in October 1988. All four ships are scheduled for delivery between December 1990 and August 1992. This will complete the T-AGOS 19 Class procurement. The FY 1990 Appropriations Act provided transfer authority for $27.0 million to include SURTASS Block-Upgrade on the three FY 1989 ships.

T-AGOS 23 Class Ocean Surveillance Ship

T-AGOS 23 is the first of a new generation of SWATH T-AGOS ships. Like the SWATH T-AGOS 19 Class, T-AGOS 23 Class extends the operational envelope of SURTASS into the higher latitude sea areas. The T-AGOS 23 Class design will also include greatly expanded acoustic collection capabilities with the addition of a second acoustic system. This program has completed the contract design phase and is in the source selection process.

AO 177 (Jumbo) Class Fleet Oiler

This program involves addition of a 108-foot mid-body section to the existing AO-177 Class oilers to substantially increase cargo capacity. All five ships are to be converted by Avondale Industries in New Orleans. In accordance with the FY 1989 Congressional guidance, the Navy modified a contract to give the ships the capacity to carry ammunition in addition to more oil. All ships will be converted by August 1992.

Aircraft Carrier Service Life Extension Program (SLEP)

USS KITTY HAWK (CV 63), the fourth carrier to enter SCN funded SLEP, is currently in her 37-month industrial availability at Philadelphia Naval Shipyard, and is scheduled to complete in February 1991. USS CONSTELLATION (CV 64) is scheduled to commence SLEP at Philadelphia in July 1990.

CVN 65 Refueling and Overhaul

USS ENTERPRISE (CVN 65) is currently scheduled to start her refueling and modernization overhaul in January 1991, at Newport News Shipbuilding. A total of $1,422 million in SCN funding was provided in the FY 1990 appropriation. The USS ENTERPRISE was last refueled in 1970.

Shipbuilding Industry

All Americans share a concern about the overall competitive capability of our nation's industrial infrastructure. Navy shipbuilding programs continue to employ approximately 97% of the direct labor involved in the active shipbuilding base and approximately 56% of ship repair direct labor. There is excess capacity in the U.S. shipbuilding industry due to the lack of commercial orders. Navy execution of Congressional direction to establish public/private shipyard competition also served to maximize opportunity for ship repair companies throughout the nation. Navy shipbuilding and repair funding has been a catalyst for innovation in ship production process applications and materials development including both the shipyards and the supporting industries. The existing base can only be maintained through a combination of stable competitive Navy programs and commercial work. The FY 1991 Navy shipbuilding budget supports such a stable and competitive program.

However, shipyard availability is not the primary mobilization constraint. It is rather in the vendor base supplying the shipyards with materials and component systems that we face the most critical production mobilization constraints. This base has suffered due to the loss of commercial work from the private sector.

Beginning in the early 1980's, the Navy has made significant changes to its depot maintenance philosophy. We have shifted from major overhauls occurring every three years to one in which a major overhaul now occurs about every five years, with short maintenance intensive selected restricted availabilities (SRA's) occurring about every 18 months between overhauls.

As the Navy's maintenance strategies have evolved, the number of overhauls have decreased from a high of 77 in FY 1977 to the 13 planned in FY 1991. The net effect of our current maintenance strategy is a reduction in the number of overhauls, a significant increase in the number of shorter more frequent availabilities, and a net increase of operational availability as observed by Fleet Commanders. This philosophy has tended to reduce the work available for our naval shipyards and provided increased opportunities for the private sector.

The Navy is deeply concerned about the future utilization of naval shipyards. We have previously reported to Congress that workload for naval shipyards would decline in the early 1990s. Some of this decline is already apparent and will be more evident in 1991. Force level changes could require substantial reduction in the public shipyard requirement. We will continue to monitor the situation and manage our public shipyards efficiently, making adjustments as necessary to support force levels and mobilization requirements.

Public/Private Ship Repair

The private sector currently performs 83 percent of Navy non-nuclear availabilities, the majority of which (73 percent of total availabilities) are assigned to private/private competition. The remainder are competed public/private. With the exception of a few availabilities per year, the only non-nuclear surface ship availabilities which are not already a part of the Public/Private Competition (PPC) program are Amphibious Assault Ships (LHAs and LHDs), Battleships, and Aircraft Carriers. The exceptions are those availabilities which are performed at a naval shipyard because of lack of private dry-dock capacity in the home-port area, or to maintain a minimum workload. There is little or no additional surface ship work which can be competed. The FY 1991 repair program illustrates the lack of interest and competition in submarine repair. Of 13 availabilities, 5 availabilities were assigned to public yards as of 20 April 1990, with 6 more pending assignment to public yards because of a lack of private sector interest in submitting proposals to repair them. Only two availabilities are expected to be competed; however, recent market surveys indicate renewed interest in the 1991 scheduled work.

As the Navy work available to both the public and private sector decreases in the 1990s, we will need to monitor the competition process carefully to be sure it enhances both efficiency and maintenance of the industrial base. We have learned that competition between the public and private sectors is very difficult to structure such that it is viewed as being fair by all parties yet leads to efficient work execution.

Competition

I would like to share with you recent data from the Annual Navy Competition Advocate General Report to Congress on competition results for FY 1989. This report showed that the percentage of Navy procurement dollars competed was 60.6%. This impressive statistic marks a consistent seven-year improvement trend and a doubling of the dollars competed since the diminutive 26.7% achieved in FY 1982. Competition is now embedded in the Navy acquisition process and has brought the U. S. taxpayer and Navy personnel higher quality products at lower costs. It is in the interest of maintaining these competitive savings, in the face of smaller overall budgets, that we seek the committee's support for continued program stability in our subsequent budget requests. Clearly, as we proceed, we will find this more difficult in the future.

Concurrent Test and Production

Congress has recognized the uniqueness of shipbuilding by amending U.S.C. Title 10, adding Section 2400 entitled: "Low rate initial production of new systems." The amendment defines what constitutes low rate initial production in order to minimize the risk of concurrent procurement and testing of major Department of Defense acquisition programs. This amendment specifically recognizes shipbuilding and satellite programs as unique among all other DOD acquisitions. It defines shipbuilding low rate initial production as production of items at the minimum quantity and rate that preserves the mobilization production base. Of necessity, this includes the vendor base. Hundreds of millions of additional dollars would be required to complete new ship programs without this statutory recognition of the uniqueness of shipbuilding.

It is important to recognize that it can take five to eight years from the contract award date to delivery of the first ship of a class. It may take another year or so to complete operational testing. This timeline is uniquely product driven. Ships take a half-decade to build and serve the nation for four decades. If the Navy were required to wait six to nine years between award of the lead ship contract and the award of follow ship contracts, the shipbuilding industry and its vendor base would collapse. Furthermore, the ships' combat systems would be obsolete early in the ships' service lives. As such, concurrency issues must be tempered by the unique requirements of Navy shipbuilding programs.

Pending Reprogramming Actions

There are two shipbuilding related reprogramming actions before the Congress. We have requested $178.8M for the lead SSN-21 (FY 1989) due to a basic construction contract award which reflects higher than anticipated labor and material charges. Also, $151.6M has been requested for the FY 1984, 1985 and 1988 SSN-688 programs, primarily to cover the Government's liability for target to ceiling coverage on the shipbuilding contracts. It is important that both of these reprogramming requests be addressed expeditiously since a portion of these funds are needed in order to satisfy near term requirements.

Summary

The Navy afloat forces of the future must have the flexibility to handle a broad range of threat scenarios. The third world threat is increasing as more highly-sophisticated modern weapons fall into the hands of many unstable government forces and of terrorist groups around the world. Constant vigilance and credible deterrence through strength is the price of peace.

As a new threat environment evolves, we must continue to upgrade our fleet capability with a combination of ship platforms able to counter a broad range of hostile environments if we as a nation are to maintain commitments to our allies. Continued emphasis on stable economic production plan funding and competition to ensure additional savings is going to be difficult to maintain.

Senator KENNEDY. Admiral Cooper.

STATEMENT OF VICE ADM. D.L. COOPER, U.S. NAVY, ASSISTANT CHIEF OF NAVAL OPERATIONS

Admiral COOPER. Thank you, Mr. Chairman.

Senator KENNEDY. It is nice to see you again. I remember our good visit up to Groton last year and up to Rhode Island where you looked over the program.

Admiral COOPER. Thank you very much. It is a pleasure to be here.

I would like to have my prepared statement entered into the record, and let me just make a few points if I may.

Despite the changing world that we see and everything that we read every day, our military strategy has not changed. The attack submarines are required in power projection, even though CBO seemed to pull back a bit on the submarine and power projection, we are definitely needed there, we are in power projection now. And of course with the strike T-LAM missile that we have. The main point that I would like to make is the threat has continued to improve capability.

Last year when I was here, one of the things we discussed was the report by the Aspin Committee. The report looked very strongly at the threat, and had looked at the growth in the Soviet submarine force and the growth in capability. As a result of that we continued to look at that point at the SSN-21, and the questions that were asked were, is the SSN-21 going to be good enough to counter that threat? I think we have put that to bed—that in fact it is going to be good enough to do that.

When Marshal Akromeyev was here, he was asked how many submarines did he think they would be producing. His answer was, he felt they would be producing four to five nuclear attack submarines a year. We have seen over the last 2 years they have been producing three to four attack nuclear submarines and nine in total.

As far as our submarines go, we can make no more major improvements in the improved 688 class submarine. We have made over 2,000 minor improvements and 25 major improvements in the SSN-688 class—the *Los Angeles* class. We will have a total of 62 of those when they finally complete. You remember you authorized the last one just last year.

As a result it is necessary to build the SSN-21. We are now 8 years into the SSN-21 program, a 13-year program from the time we started. We would like to look into developing a new submarine until it comes down the way in May of 1995. So far,it has met all of the requirements. We have done an infinite amount of testing on this thing in every single component as we go along, as we look at the concurrency things that you have heard.

The Secretary of Defense recently submitted a concurrency report on all of his major systems in defense. In that, he concluded the BSY-2 and the SSN-21 were of moderate risk. In the technical area, he concluded that both of them were of "low" risk. The *Seawolf* will be delivered with a fully capable BSY-2 system. We are working on that. We have it programmed in such a way with lots of oversight to look at all of these concerns which have been expressed.

Right now, there is no reasonable alternative to the SSN-21. This is a submarine that we really need. We have one built and are asking for two this year. My personal statement would be that there is no valid programmatic reason to delay the SSN-21.

Thank you, sir.

[The prepared statement of Admiral Cooper follows:]

STATEMENT OF
VICE ADMIRAL D. L. COOPER, U.S. NAVY
ASSISTANT CHIEF OF NAVAL OPERATIONS
(UNDERSEA WARFARE)

Mr. Chairman and distinguished members of the Committee, I am privileged to report to you the status of the submarine force. During today's review, I will discuss the current and future requirement for attack submarines in light of recent changes in the world, and, more specifically, **how the execution of our national military strategy, the projected threat, and the advance of technology continues to substantiate the absolute need for the SEAWOLF (SSN-21) Class of submarines.** In addition, I will discuss the status of our ongoing TRIDENT submarine modernization program, and **why this program is vital to our national security and must be sustained.**

There is no question that the recent events in the Soviet Union and Eastern Europe have altered the social and political makeup of the world. These changes have served to remind us of the rapid and unpredictable nature by which political circumstances and intentions can change. Thus, when addressing the requirement for a modern attack submarine force, we must not allow ourselves to focus on perceptions and platitudes. **We must recognize the requirement to counter the continuing threats that still directly challenge our worldwide vital interests.** In fact, although dramatic reforms have taken place in the world, **the maritime component of our national military strategy, which is fundamentally based on our dependence as an island nation, has not changed.** This strategy requires us to maintain the capability to provide an early response to a broad spectrum of possible conflicts and to be able to project naval power with a sustainable, survivable, far-forward presence. **The fundamental characteristics of our attack submarine force, stealth, mobility, firepower and endurance, are an essential part of the sustainable, survivable, far-forward naval presence**

required by our national military strategy.

As the world shifts from a bipolar to a multipolar system our involvement in regional crises can be expected to increase. With the continued proliferation of advanced technology weapons to Third World nations, the mission of regional crisis containment will become more difficult. Attack submarines provide invaluable options in executing this important phase of our national military strategy. In a crisis, SSNs can rapidly be deployed to any ocean of the world, gather intelligence and surveillance information covertly, and remain on station unsupported in hostile waters for long periods. While on station, the SSN can also provide the Battle Force Commander with significant strike capability, mining and special forces insertion capability -- all while remaining completely undetected. When no longer needed, the submarine can quietly be withdrawn. This mobility, coupled with the on station endurance, survivability, and power projection capability of an attack submarine, provides unique flexibility in controlling a broad spectrum of regional crises and conflicts. Thus, **the submarine force creates leverage out of proportion to its size because an adversary never knows whether or in what number submarines might be present.**

If conflict escalation control fails, leading to a major regional involvement or global conflict with a maritime power, the far-forward covert presence of the attack submarine force can "seize the initiative", and quickly neutralize enemy forces before they leave home waters. If enemy forces can be contained close to their homeland, they will not be able to inflict harm to U.S. and allied forces or to disrupt the flow of resources between the U.S. and our allies.

Since the need for attack submarines to execute our national military strategy has not changed, the requirement for the specific type of submarine needed to implement that part of the strategy is driven by the projected threat capability and the missions which we will execute. **Although the threat of nuclear war and the invasion of Europe may have decreased, the threat from the Soviet's rapidly modernizing and increasingly capable submarine force has not.** Recent intelligence reaffirms that the Soviets are firmly committed to attack submarine development and production. Some projections may indicate that the Soviet attack submarine force level will decrease. This quantitative reduction in force would be solely due to the retirement of their oldest, less capable classes of submarines. Simultaneously, the Soviets are continuing to produce markedly improved submarines assisted by the acquisition of western technology and a dedicated, well funded research and development program. Thus, **the Soviet's projected force reductions, coupled with a building rate to modernize their forces, will produce a 21st century submarine force significantly more capable, although slightly smaller in size.**

The United States Submarine Force has maintained its historic edge in undersea superiority and its growing role in power projection capability because our force has consistently been superior in quality. We have never had equal numbers. We have achieved this qualitative superiority through the systematic modernization of our force in the three vital areas of submarine performance -- weapons, sensors, and platform capability. This modernization of force capability has been centered mainly around the Los Angeles (SSN-688) Class of submarines. Originally designed in the late 1960's and initially delivered in 1976, the Los Angeles Class has proven to be a versatile, flexible, and effective platform. To keep pace with threat technological advances, this class has incorporated over 25 major and 2000 minor improvements in the last two decades. This has resulted in nearly a complete redesign of the interior spaces of the original submarine and a substantial improvement in its capability. The newest ships, therefore, have been designated the Improved 688 (or I688) Class. First delivered in 1988, the I688 Class of attack submarines wields increased firepower with the addition of 12 vertical launch TOMAHAWK missile tubes, an improved combat system (AN/BSY-1), improved quieting, and new under-ice and mining capabilities. In the process of installing all of these improvements, however, we have exhausted the design weight margin of the original 688. **The I688 cannot physically accommodate the changes necessary to incorporate the next generation of technology to face the projected threat of the 21st century.**

With strong Congressional support, the SEAWOLF program was begun eight years ago to meet the projected ASW threat and to provide a balanced power projection capability option in the execution of our national military strategy in the 21st century. When SEAWOLF joins the fleet in 1995, she will take to sea:

- **The ultimate in 20th century stealth technology** - The SEAWOLF will be the quietest submarine in the world at any speed. In fact, SEAWOLF will be over 30 times quieter than our original 688 Class of submarines. The SEAWOLF's stealth, coupled with other onboard systems, will give her a better probability of survival and allow her to operate in any area of the ocean while conducting ASW and power projection missions.
- **Double the firepower of the most advanced operational Soviet submarine** -SEAWOLF's torpedo room will carry TOMAHAWK (sea and land-attack) missiles, HARPOON missiles, MK-48 ADCAP and CCAPS torpedoes, mines, and when developed, remotely operated vehicles.
- **Highest tactical speed of any submarine in the world,** providing greater search effectiveness and lower probability of counterdetection. In a submarine-on-submarine encounter in open ocean, tactical speed is the most significant factor in determining the success of the mission.
- **Sufficient design margin for growth to incorporate future technology advances.** We have utilized advanced technology design procedures to construct SEAWOLF to allow efficient

modernization and maintenance to take place throughout the ship's life. This will also result in reduced operating and support costs.

Throughout the eight years of the SEAWOLF program, close Congressional and DoD oversight has resulted in numerous reports, audits, reviews, analyses, and hearings which have probed every aspect of the program. Every problem and issue raised by these inquiries has been or is being resolved by the Navy to ensure that the SEAWOLF will meet all of its Top Level requirements.

One of the specific issues currently being raised is the effectiveness of the SSN-21 against the projected threat. **The Congressionally directed initial operating capability (IOC) plus-ten-year dynamic mission analysis, completed by DoD early this year, clearly showed that the SEAWOLF will be superior to the projected threat at IOC plus-ten-years.** This mission analysis was conducted using the same mission scenarios as previously accepted studies and a threat which was approved by CIA, DIA, and the Navy intelligence community. An SSN-21 Early Operational Assessment, recently completed by the Navy's Operational Test and Evaluation Force, also concluded that the SEAWOLF will be operationally effective against the projected threat.

Another issue being raised is the status of the development of the SEAWOLF's AN/BSY-2 combat system. This program, after initially experiencing difficulties in software development, is on schedule and will comply with all applicable DoD directives. Learning from previous ship combat system design integration, we have established a team of top shipyard, Navy, and contractor personnel to ensure the timely integration of the BSY-2 into the submarine. **The SEAWOLF will be delivered with a very capable BSY-2 combat system sufficient to meet the threat.**

There is a requirement for positive action on our $178M reprogramming request. The SEAWOLF lead ship cost increase was due mainly to unexpected changes in economic factors, such as labor rate escalation and increased cost of equipment due to higher quieting standards. Specifically, while estimated man-hours to construct SEAWOLF have remained constant, as originally projected, actual shipyard rates and the costs of the shipbuilder-furnished material and equipment have risen. **It is absolutely vital to the SEAWOLF program execution that the Congressionally directed reprogramming requested be approved promptly to preclude costly delays in the construction of the lead ship.**

Over the past eight years, the Navy has invested over two billion dollars in research and development to design, develop and test shipboard prototype components. The component testing conducted to date on the SSN-21 equipment is unparalleled in previous submarine programs. The submarine success record of delivering submarines that meet all design requirements is clear, stretching all the way back to the NAUTILUS and POLARIS shipbuilding programs. **The SEAWOLF will meet all of its Top Level requirements when delivered in May of 1995.**

The SEAWOLF program is on schedule and meeting all of its requirements. As a result, there is no valid justification to delay follow-on SEAWOLF class submarines by concluding that additional time will somehow provide us with a more capable and cost-effective submarine. In fact, delaying the award of additional SSN-21s until the lead ship completes post-delivery testing would be catastrophic to our nation's undersea superiority and would also result in greatly increased program cost. Without a continuing new construction workload, the two shipyards would experience voids in key construction trade work as early as 1992. I am not an expert on the submarine production base, but I am convinced that the smaller component vendors who are so vital for the quality specifications for both submarine safety and nuclear safety components are now in a fragile position. A cut in the number of SSNs we are requesting would have a major impact.

When the NAUTILUS transmitted the historic message "underway on nuclear power" in 1955 as she steamed down the Thames river, submarine warfare was revolutionized. Since that time, with strong Congressional support, we have maintained undersea superiority and a growing power projection capability through the continued modernization of our submarine force. We cannot afford to relinquish this superiority. **The SEAWOLF's revolutionary improvements in ASW and power projection capability are a key to the successful execution of our national military strategy across the entire spectrum of possible conflicts in the 21st century.**

STRATEGIC SUBMARINE FORCE

The goal of the U.S. strategic deterrent forces (TRIAD) is to deter adversaries from committing aggression. This is best assured by reliable, capable, and responsive strategic forces with sustained survivability. **Strategic submarines (SSBNs) possess all these necessary attributes which, combined with the invulnerability of the SSBN force, result in a viable and survivable stabilizing strategic deterrent that is a keystone of our national strategic posture.**

Our newest class of missile-carrying submarine is continuing a very successful strategic modernization program, the TRIDENT II (D-5) missile program. This program is reaching maturity at precisely the right time in our nation's history; it will enable us to safely weather the period of strategic and defense uncertainly which lies ahead. **The TRIDENT II (D-5) missile, with its improved accuracy, greater range, and larger payload, allows the seagoing portion of our TRIAD, for the first time, to engage the full spectrum of targets.** As you know, some problems with the initial TRIDENT II (D-5) submerged launch were experienced last spring. The problems were identified as deficiencies in the design of the missile's nozzle and were quickly corrected, proving once again the value of the superb expertise which resides in the Navy's Strategic Systems Program Office (SSPO). Since the modifications to the missile nozzle have been installed, seven successful test launches have been completed. **The TRIDENT II (D-5) program achieved initial operational capability (IOC) in March 1990, two years ahead of the original schedule.** The FY91 budget requests funding for 52 TRIDENT II (D-5) missiles. The recommended procurement profile is required to support TRIDENT submarine loadouts and the vital evaluation test programs which ensure our confidence in continued system reliability and accuracy.

In March 1990, the USS TENNESSEE (SSBN-734) became the first TRIDENT II (D-5) missile-capable ship to deploy from the new operating base at King's Bay, Georgia. Seven TRIDENT II (D-5) capable submarines are presently under construction. The President's budget is requesting funding for the procurement of the 18th TRIDENT submarine and advanced procurement for the 19th and 20th. These TRIDENT submarines will replace aging Poseidon and TRIDENT I backfit submarines when they reach mandatory retirement toward the end of this decade. The eight Pacific Fleet TRIDENT I capable submarines will also be modernized with the TRIDENT II (D-5) starting with the USS OHIO as she enters her first overhaul period in 1993. Moving to an all D-5 force has important advantages. The increased range and more potent warhead not only adds targeting flexibility, but enhances SSBN survivability by expanding the operational patrol areas for the TRIDENT submarine. Logistic support will also become more cost-efficient by having a common missile. This effort, combined with the continued TRIDENT submarine new construction program, will result in the complete modernization of the strategic submarine force. **Our goal of 21 operational TRIDENT submarines, with two or three TRIDENTs in overhaul, is consistent with our START negotiations where we have agreed in principal with the Soviets to exempt submarines in overhaul from accountability in START. This most important and**

highly successful program deserves your strong continued support.

Recently, concern has been expressed over the shutdown of the Department of Energy's plutonium component plant at Rocky Flats and its potential impact on the TRIDENT program. Rocky Flats is the single supplier of plutonium warhead components which includes the MK-5/W-88 warhead carried by the TRIDENT II (D-5) missiles. The current plant shutdown will not affect the loadout of our next TRIDENT II (D-5) submarine, USS PENNSYLVANIA (SSBN-735) in the fall of 1990. Current estimates indicate that the plant should reopen soon which will enable MK-5 warhead production to meet projected needs. Therefore, Rocky Flats should not be a factor in considering the TRIDENT submarine and the TRIDENT II (D-5) missile request in the FY91 budget.

The strategic submarine force is unquestionably a cornerstone of our strategic deterrent force by virtue of its survivability, reliability, and capability. The ongoing modernization of the strategic submarine force is absolutely vital to our national security and must be sustained. The TRIDENT program warrants the full support of Congress.

Senator KENNEDY. Admiral Nyquist.

STATEMENT OF VICE ADM. JOHN W. NYQUIST, U.S. NAVY, ASSISTANT CHIEF OF NAVAL OPERATIONS.

Admiral NYQUIST. Mr. Chairman, thank you, sir. I would also like to enter my prepared statement for the record.

Senator KENNEDY. All of the statements will be included in the record in their entirety.

Admiral NYQUIST. Mr. Chairman, for more than 40, years the members of this committee have supported a national military strategy that has successfully underwritten worldwide security and stability. That investment is now bearing fruit with clearly positive developments throughout Eastern Europe.

Appearances aside, the Soviet Union remains a formidable naval power. While it is true that the Soviets are scrapping older, obsolescent ships, so far the reductions have been in body fat and not muscle.

Last year they scrapped two, old *Sverdlov* cruisers, nine destroyers, all of which were over 30 years old, five small frigates and 30 aging diesel submarines.

Let us look at what replaced them. During the same period last year the Soviet navy delivered one guided missile aircraft carrier, one SLAVA guided missile cruiser, three modern guided missile destroyers, nine frigates, five nuclear and four diesel submarines. Also, they launched five more nuclear submarines, four diesels, one nuclear cruiser, two more guided missile destroyers and six more frigates.

We must be very cautious in any analysis of a Soviet naval threat that does not account for this growing capability. Even under the most optimistic assumptions of decreased risk from the communist bloc, potential dangers in the rest of the world, particularly the Third World, are increasing.

To execute the Navy's missions of strategic deterrence, sea control, power projection and strategic——

Senator KENNEDY. Excuse, me, Admiral Nyquist—just on those numbers, do you have any estimates of what is going to be the situation this year in the Soviet Union?

Admiral NYQUIST. This year, Mr. Chairman——

Senator KENNEDY. You gave us last year's situation, and I just wonder if you know what they are intending to scrap and what is coming on stream.

Do you have that?

Admiral NYQUIST. They have launched, and so they are not complete, so these would be this year's ships, Mr. Chairman.

Senator KENNEDY. Do you have a general estimate or do you want to provide it for us?

Admiral NYQUIST. Several submarines and two or three major surface ships.

Senator KENNEDY. And do they intend to de-commission any ships?

Admiral NYQUIST. That is a little bit harder to predict, Mr. Chairman. We assume that there are some older ships still around, ships that they have not operated for a number of years. So the potential is certainly there.

While we continue to assess our overall defense requirements in a changing world, as Mr. Cann said, the major warship review being our most current example, we must sustain balanced forces, forces capable of handling the range of threats from the possibility of Soviet conflict to Third World aggression.

As we look ahead, the Navy of the 1990s must maintain the core elements of maritime superiority, our technological edge and our superb, highly-trained and dedicated sailors.

Our fiscal year 1991 SCN budget includes $11.2 billion for 15 new ships. The majority of the ships in this plan are force sustainers, not force builders. That is, they will be replacing older ships which have decreased capability to carry out their missions.

No matter what the final decision on threat strategy and force level, Mr. Chairman, the ships in this budget are required to sustain the fleet.

Thank you very much, sir.

[The prepared statement of Admiral Nyquist follows:]

STATEMENT OF

VICE-ADMIRAL JOHN W. NYQUIST, U. S. NAVY

ASSISTANT CHIEF OF NAVAL OPERATIONS

(SURFACE WARFARE)

SHIPBUILDING AND CONVERSION, NAVY (SCN)

Mr. Chairman and distinguished members of the committee, I am Vice Admiral John W. Nyquist, USN, the Assistant Chief of Naval Operations (Surface Warfare) and the sponsor for the Shipbuilding and Conversion, Navy (SCN) Appropriation.

It is my privilege today to present the Navy's SCN budget request for Fiscal Year 1991. The ships in this plan will sustain and upgrade the capabilities of the Fleet into the next century.

For more than forty years the national military strategy has successfully underwritten worldwide security and stability. That investment is now bearing fruit with the clearly positive developments throughout Eastern Europe. The democratization of that part of the world appears to be moving at breakneck speed, but appearances aside, the Soviet Union remains a formidable military power. We must be cautious and determined that appearances are followed by actions and deeds.

Under the best intelligence estimates we can gather, the USSR will still retain the world's largest military machine. Despite the Kremlin's preoccupation with domestic political and economic reform, modernization of this vast military arsenal will continue. Soviet Armed Forces will almost certainly be smaller in size -- but will inevitably be better. Fewer but more competent and motivated officers and enlisted personnel; fewer but more capable ships and submarines; fewer distant area naval operations but more realistic training in local waters -- these can produce a force very capable of accomplishing its missions. The question we must ask is whether the smaller but thoroughly modernized Soviet Navy of five years from now will be less capable or more capable of performing those missions. And we must not forget that, whatever the change in the Soviet political-military landscape, the USSR will remain the principal military threat, as it retains the potential, using nuclear weapons, to destroy the United States and our Allies.

As an example, and despite the USSR's escalating economic and social problems, the Soviet Navy had a year of growth in 1989 of which any Navy could be proud. Indeed, in terms of the construction of high-quality, high-technology submarines, surface ships and aircraft, as well as the further development and modernization of new weapons/electronic systems and shipyards, this was an outstanding year for Soviet naval power. It is true the Soviets are scrapping older, obsolescent units at an unprecedented rate, but so far the reductions are in "body fat" not "muscle." At the same time, they continue to modernize their shipbuilding infrastructure and yards, giving themselves future flexibility to construct either merchant or naval units as their national interests require.

But even given the most optimistic assumptions of decreased risk from the Communist Bloc, the potential dangers in the rest of the world, particularly the third world, are increasing. To execute the U.S. Navy's missions of strategic deterrence, sea control, power projection and strategic sealift across the entire range of possible threats, we require quality, capable forces in the right numbers.

VG-1

The ships which are included in our 1991 budget request have roles across the entire spectrum of conflict, from overseas presence during peacetime to general war. At the low end of the spectrum, our peacetime operations enhance deterrence worldwide, support U.S. diplomacy and policy, and provide for rapid response in a crisis. At the high end, our fleet ballistic missile submarines provide the threat of global nuclear response which forms the basic underpinning of our deterrent strategy.

VG-2

It is more important now than ever before to maintain the forward momentum of our shipbuilding program. Recent problems with overseas base rights have underscored the importance of a Fleet which can be sent any place on the globe to show the flag or project power. We must also be concerned that our shipbuilding industry is weakened and the industrial base is eroding. Our ability to rebuild a fleet in time of crisis is considerably diminished.

We expect to reach 551 ships by the end of FY 1990 as new ships already under construction replace aging, marginally capable units which are reaching the end of their useful service lives.

VG-3

In 1989, we took delivery of 21 new ships and two conversions. The new ships are listed on this slide.

FISCAL YEAR 1991 SCN BUDGET

Our FY 1991 SCN budget includes $11.19 billion for 15 new ships.

I will briefly describe each program for which we are requesting funding in FY 1991.

VG-4

STRATEGIC SUBMARINE FORCE

We presently have 34 strategic submarines, composed of 24 POSEIDON hulls and 10 OHIO class hulls. Of the 24 POSEIDONS, 12 carry the POSEIDON (C-3) missile and 12 carry the TRIDENT I (C-4) missile. Eight of the OHIO class submarines also carry the TRIDENT I (C-4) and two carry the new TRIDENT II (D-5) missile.

U.S. strategic forces (the TRIAD) provide deterrence to the Soviet Union, which continues to modernize its strategic offensive forces. Deterrence is best assured by having forces which are reliable, responsive, and survivable. The submarine launched ballistic missile (SLBM) is the only TRIAD weapon system possessing all three of these elements and therefore, it serves as the keystone to our national strategic posture. One hundred percent SSBN at sea survivability promotes crisis stability and long endurance provides for escalation control.

On a day-to-day basis, our strategic submarines, with their SLBM's, provide the most economical and single greatest deterrent to nuclear war. These submarines carry almost 50 percent of the strategic warheads in our country's inventory for only about 25 percent of the Department of Defense strategic budget.

OHIO Class TRIDENT Submarine

The TRIDENT submarine's overall capability and firepower is unmatched. Of the 17 OHIO Class TRIDENT submarines authorized, eight are making routine patrols from their Bangor, Washington base and two are preparing to patrol with the TRIDENT II (D-5) missile. The TRIDENT force has completed over 140 patrols to date.

The TENNESSEE (SSBN 734) is the first TRIDENT II (D-5) missile capable submarine. Seven TRIDENT submarines are presently under construction. USS PENNSYLVANIA (SSBN 735) was delivered on time and is conducting shakedown operations. The President's strategic modernization plan directs building one TRIDENT SSBN each year. All pre OHIO Class SSBNs will be retired in the 1990s. It is vital to maintain a minimum building rate of one TRIDENT per year to continue a credible, fully survivable SSBN force at sea into the next century. In the FY 91 budget we are requesting $1,244.6 million for the eighteenth ship plus $143.0 million for long lead material for the nineteenth and twentieth ships.

VG-5

ATTACK SUBMARINE FORCE

Recent Soviet announcements regarding submarine force level reductions must be considered in the context of how their overall force capability will change in the next decade. The Soviet plan to decommission their older SS and SSN classes will reduce their force numbers; however, it will do little to reduce their submarine force capability. In fact, these reductions, when coupled with their continued building rate of new submarines of significantly advanced classes, will produce an end-of-decade submarine force that is significantly more capable, although smaller in size.

There are currently 91 nuclear attack submarines and one conventional submarine in the U.S. Force. Of these, 42 are LOS ANGELES (SSN 688) Class submarines.

SEAWOLF (SSN 21) Class Submarine

The FY 1991 budget requests $2342.9 million for procurement of the second and third SSN-21s and $1139.1 million in advance procurement for the long leadtime nuclear propulsion plant and hull, mechanical and electrical equipment for follow on submarines of the SEAWOLF class. As directed by the FY 90 Appropriations Conference Report, a dynamic mission analysis for the SSN-21 at initial operational capability (IOC) date-plus-ten years (2005) was completed by the Office of the Secretary of Defense in January of this year.

Based on the results obtained from the dynamic mission analysis, the SSN-21 performance will be superior to the best estimate of the threat at IOC and at IOC-plus-ten years in every one of the eight representative attack submarine mission areas analyzed. The SSN-21 represents a revolutionary improvement in warfighting capability. From its inception,the SSN-21 has been designed to meet any threat and optimize its own inherent capabilities to conduct power projection missions in the 21st century.

VG-6

AIRCRAFT CARRIERS

Our aircraft carriers are deployed worldwide in support of our national commitments. They are capable of executing response options ranging from peacetime presence through general war. Together with their embarked air wings, the carriers have vital roles in strike, anti-surface, anti-air, and anti-submarine warfare across the full spectrum of conflict.

In FY 88, the Congress appropriated full funding for two NIMITZ Class nuclear aircraft carriers, CVN 74 and CVN 75. Two other CVNs were approved in FY 1983 and the first of these, USS ABRAHAM LINCOLN (CVN 72), joined the Fleet this past year.

VG-7

SURFACE COMBATANTS

We have made great strides in the past few years in improving the quality of our surface combatants, although fiscal constraints have precluded solving our numerical shortfalls. The soon-to-be introduced ARLEIGH BURKE (DDG-51) and the proven TICONDEROGA (CG-47) will form the backbone of the surface combatant fleet for the foreseeable future. Both carry the most advanced multi-threat combat systems afloat today, and can execute offensive and defensive missions independently or in conjunction with Carrier Battle Groups. The combination of HARPOON and TOMAHAWK has expanded the roles of our surface combatants, complicated enemy targeting, and significantly increased the Navy's offensive power. Anti-Air Warfare capable ship force levels represent our single greatest shortfall.

ARLEIGH BURKE (DDG 51) Class Guided Missile Destroyers

The ARLEIGH BURKE Class guided missile destroyer (DDG 51) is by far the most powerful, versatile, and survivable destroyer ever to go to sea. Combining the AEGIS anti-air warfare and SQQ-89 anti-submarine warfare combat systems with vertical launch cells carrying SM-2 surface-to-air STANDARD missiles, TOMAHAWK anti-ship and land-attack cruise missiles, HARPOON, the rapid-fire light-weight 5"/54 caliber gun, and close-in weapons, these ships provide unprecedented destroyer warfighting capability. The ARLEIGH BURKE class also features major advancements in survivability, including reduced radar cross-section, all steel construction with additional armored sheathing and the latest state-of-the-art damage control systems.

There are presently 13 DDG-51 Class destroyers appropriated and under contract. This ship replaces the aging DDG 2 and DDG 37 Class destroyers which are becoming obsolete and will be retired over the next three years. As the DDG 51 program continues, we will build additional destroyers to replace our older cruisers and to build toward our Battle Force Capable force level objective.

The FY 1991 budget includes $3,566.4 million full funding for the second group of five DDG 51s from FY-1990 multi-year procurement and $3.6 million for advance procurement.

AMPHIBIOUS WARFARE SHIPS

The primary factors in determining the amphibious force level and ship design are the Marine Corps' lift requirement and the ship to shore assets required to execute the landings.

Our goal is to lift the Assault Echelons of both a Marine Expeditionary Force and a Marine Expeditionary Brigade. The Assault Echelon includes the most critical assault elements needed to seize a beachhead and rapidly build up combat power ashore. These elements must be transported, landed and supported from specialized amphibious ships. The remainder of the landing force makes up the Assault Follow-on Echelon, comprised of the troops, equipment and supplies needed to support and sustain the initial assault. These follow on landing force elements are embarked in Military Sealift Command controlled fleet ships, which may be government owned and chartered or requisitioned from the private sector.

VG-8

WASP (LHD 1) Class Amphibious Assault Ships

Congress has fully funded 4 WASP Class Amphibious Assault ships to date. The FY 1991 request includes $959.8 million for construction of LHD 5.

VG-9

LSD 41 (Cargo Variant) Dock Landing Ship

Eight ships of this class are in building and the first of the Cargo Variant was funded in 1988. This year we are requesting $240 million to fund the third LSD 41 (Cargo Variant). This ship will transport and launch amphibious craft and vehicles with their crews and embarked personnel in amphibious assault operations. It will also provide limited docking and repair services for conventional landing craft and LCAC. These ships differ from the original LSD 41 in that they have additional cargo capacity and while carrying two fewer LCAC.

VG-10

Landing Craft Air Cushion (LCAC)

The FY 1991 budget includes $244.7 million for twelve of these modern landing craft and $23.2 million for advance procurement.

The LCAC is a fully amphibious air cushion vehicle capable of operating from existing and future well deck ships. It transports weapons systems, equipment, cargo and personnel of the assault elements of the Marine Air/Ground Task Force both from ship to shore and across the beach.

VG-11

MINE WARFARE SHIPS

For many years, our mine countermeasures capability was inadequate to meet the threat. We are now aggressively addressing that deficiency. We have established a minimum objective of 47 new mine countermeasures units which, in conjunction with our MCM helicopters, will have the mission of clearing U.S. waters and strategic choke points in time of war. The MHC 51 is a new class of ships designed to perform reconnaissance, classification and neutralization of moored and bottom mines in our harbors and coastal waters.

MHC 51 Class Coastal Mine Hunter

The lead ship of the MHC 51 Class was funded in the FY 1986 appropriation. The FY 1991 budget request includes $268.1 million for three follow on units.

VG-12

COMBAT LOGISTICS FORCES

Recent concerns over availability of overseas bases have underscored our dependence on these ships to keep our battle forces operating. Combat logistics force ships include multi-product station ships with the speed and armament to remain with the Carrier Battle Groups and single product shuttle ships to carry fuel, ordnance, stores and provisions from advance logistic bases or consolidation points at sea. The primary station ship is the AOE fast combat support ship. Shuttle ships include fleet oilers (AOs/TAOs), ammunition ships (AEs/TAEs), and stores ships

(AFS/TAFS). In the event of non-availability of an AOE, one AOR and one AE may be assigned to a Battle Group.

AOE 6 Class Fast Combat Support Ship

In FY 1987 the Congress appropriated the funds for the lead ship of the AOE 6 Class. We plan to procure one of these ships for each Battle Group. The FY 1991 budget includes $398.2 million for one of these ships.

VG-13

OCEANOGRAPHIC SHIPS

We are continuing to address the block obsolescence of our 1960-vintage oceanographic ships. The T-AGS ship requested in the FY 91 SCN Program will be a replacement for ships that have exceeded their effective service life and are technologically inadequate for modern complex oceanographic operations. The replacement ships will be multi-mission capable -- performing ocean survey and data collection in support of fleet operations and systems development. The FY 1991 request includes $43.1 million for construction of one TAGS (coastal) oceanographic vessel.

OUTFITTING/POST DELIVERY

We are requesting $231.1 million in FY 1991 for outfitting. Outfitting funds purchase repair parts and consumables to fill initial ship allowances for ships approaching delivery.

The FY 1991 budget also includes $154.5 million for post delivery. Post delivery funds are used to pay for all work required to correct deficiencies identified during trials or post delivery.

Mr. Chairman, that concludes my overview of the FY 1991 SCN Budget Request. I appreciate this opportunity to appear before your committee to assist you in your deliberations on the Defense Authorization Bill and urge your continued strong support for our shipbuilding program.

FY 1991
SHIPBUILDING AND CONVERSION, NAVY
BUDGET REQUEST
(IN MILLIONS OF DOLLARS)

	QTY	FULL FUNDING	ADV PROC	TOA
NEW CONSTRUCTION				
TRIDENT	1	1244.6	143.0	1387.6
SSN-21	2	2342.9	1139.1	3482.0
DDG-51	5	3566.4	3.6	3570.0
LHD-1	1	959.8		959.8
LSD-41 (CV)	1	240.0		240.0
MHC	3	268.1		268.1
AOE	1	398.2		398.2
OCEANOGRAPHIC RESEARCH	1	43.1		43.1
LCAC	(12)	244.7	23.2	267.9
CONVERSION/ACQUISITION/OTHER				
CV SLEP	-	113.1		113.1
OTHER COSTS	-	465.4		465.4
TOTAL SCN	15			11,195.2

SHIPBUILDING AND CONVERSION, NAVY
FY 1991/94 SHIPBUILDING PLAN

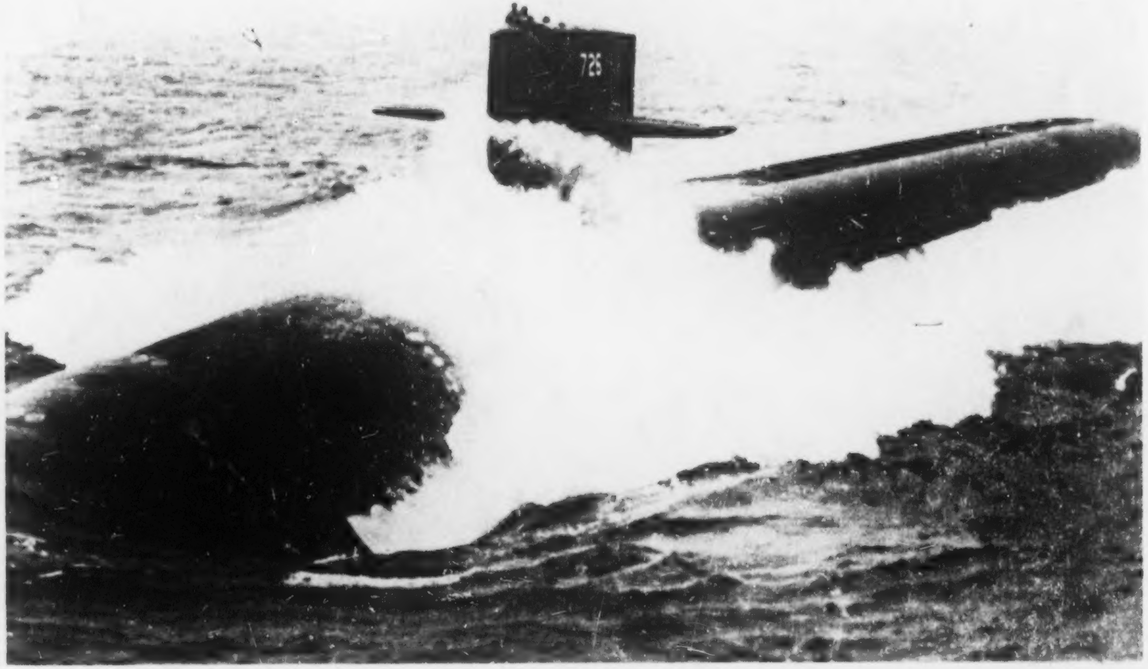
	FY 1991	FY 1992	FY 1993	FY 1994
NEW CONSTRUCTION				
TRIDENT	1	1	1	1
SSN-21	2	-	6	-
DDG-51	5	10	-	10
LHD-1	1	-	1	-
LSD-41 (CV)	1	1	1	1
MHC	3	4	5	-
TAGOS	-	2	3	-
AE	-	-	1	2
AOE	1	-	3	-
OCEANOGRAPHIC RESEARCH	1	2	1	2
AGOS	-	1	-	2
ARS	-	-	-	1
AR	-	-	-	1
LCAC	(12)	(12)	(12)	(11)
SUBTOTAL	15	21	22	20
CONVERSION				
CV SLEP	-	-	1	-
MOORED TRAINING SHIP	-	(1)	-	-
SUBTOTAL	-	-	1	-
TOTAL SHIPS	15	21	23	20

CY 1989 NEW SHIP DELIVERIES

NR	CLASS/DESCRIPTION OF SHIP	NAME AND HULL NUMBER
1	**NIMITZ** (Nuclear Aircraft Carrier)	USS LINCOLN (CVN-72)
1	**OHIO** (Strategic Missile Submarine)	USS PENNSYLVANIA (SSBN-735)
1	**WASP** (Amphibious Assault Ship)	USS WASP (LHD-1)
3	**LOS ANGELES** (Nuclear Attack Submarine)	USS NEWPORT NEWS (SSN-750)
		USS PASADENA (SSN-752)
		USS TOPEKA (SSN-754)
3	**TICONDEROGA** (Guided Missile Cruisers)	USS PHILIPPINE SEA (CG-58)
		USS NORMANDY (CG-60)
		USS CHANCELLORSVILLE (CG-62)
1	**OLIVER HAZARD PERRY** (Guided Missile Frigate)	USS INGRAHAM (FFG-61)
1	**WHIDBEY ISLAND** (Landing Ship Dock)	USS GUNSTON HALL (LSD-44)
1	**TAO 187** (Fleet Oiler)	USS LEROY GRUMMAN (TAO-195)
3	**AVENGER** (Mine Countermeasures Ships)	USS DEFENDER (MCM-2)
		USS SENTRY (MCM-3)
		USS GUARDIAN (MCM-5)
5	TAGOS 1 (Ocean Surveillance Ships)	USNS AUDACIOUS (TAGOS-11)
		USNS BOLD (TAGOS-12)
		USNS TITAN (TAGOS-15)
		USNS CAPABLE (TAGOS-16)
		USNS TENACIOUS (TAGOS-17)
1	Oceanographic Ship	USNS MAURY (TAGS 39)

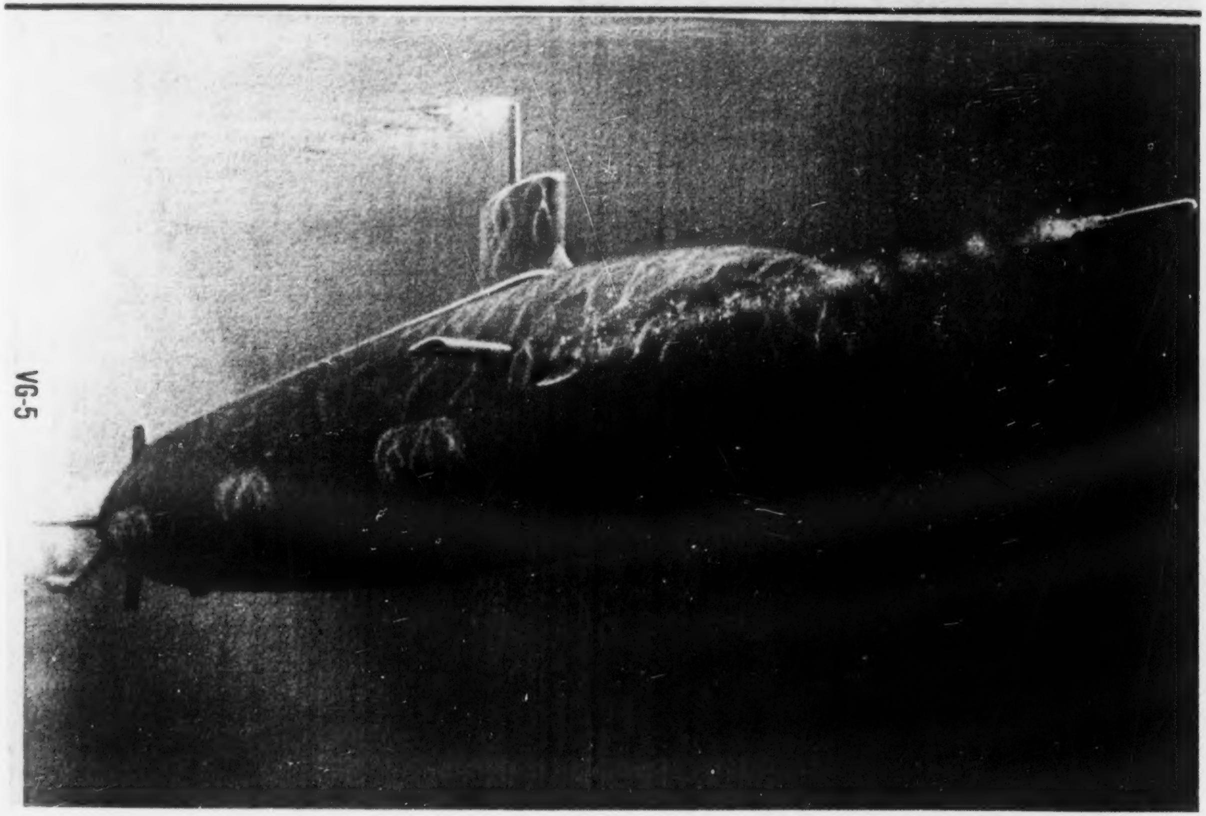
THE CONVERSIONS INCLUDED TWO AUXILIARY CRANE SHIPS (TACS)

TRIDENT SUBMARINE - SSBN



VG-4

NUCLEAR ATTACK SUBMARINE - SSN 21



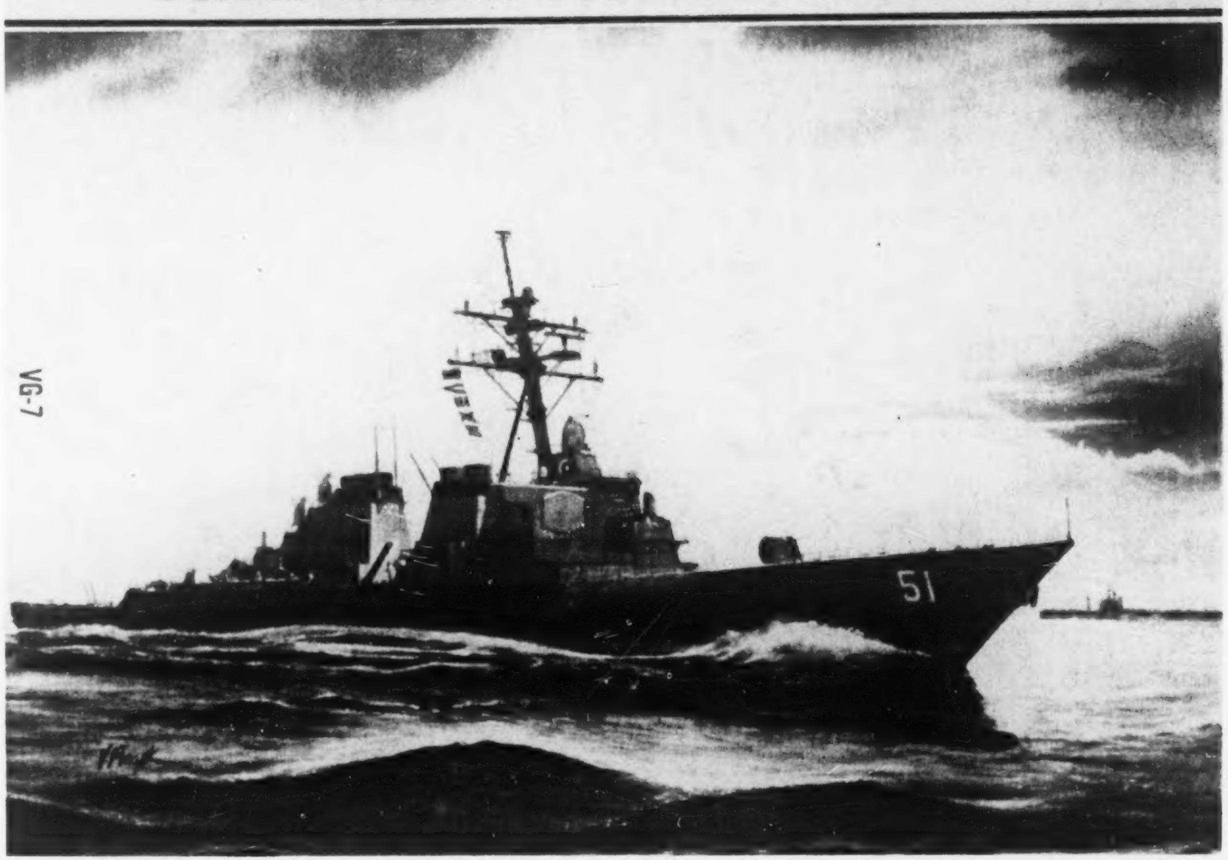
VG-5

VG-6

U.S.S. ABRAHAM LINCOLN (CVN72)

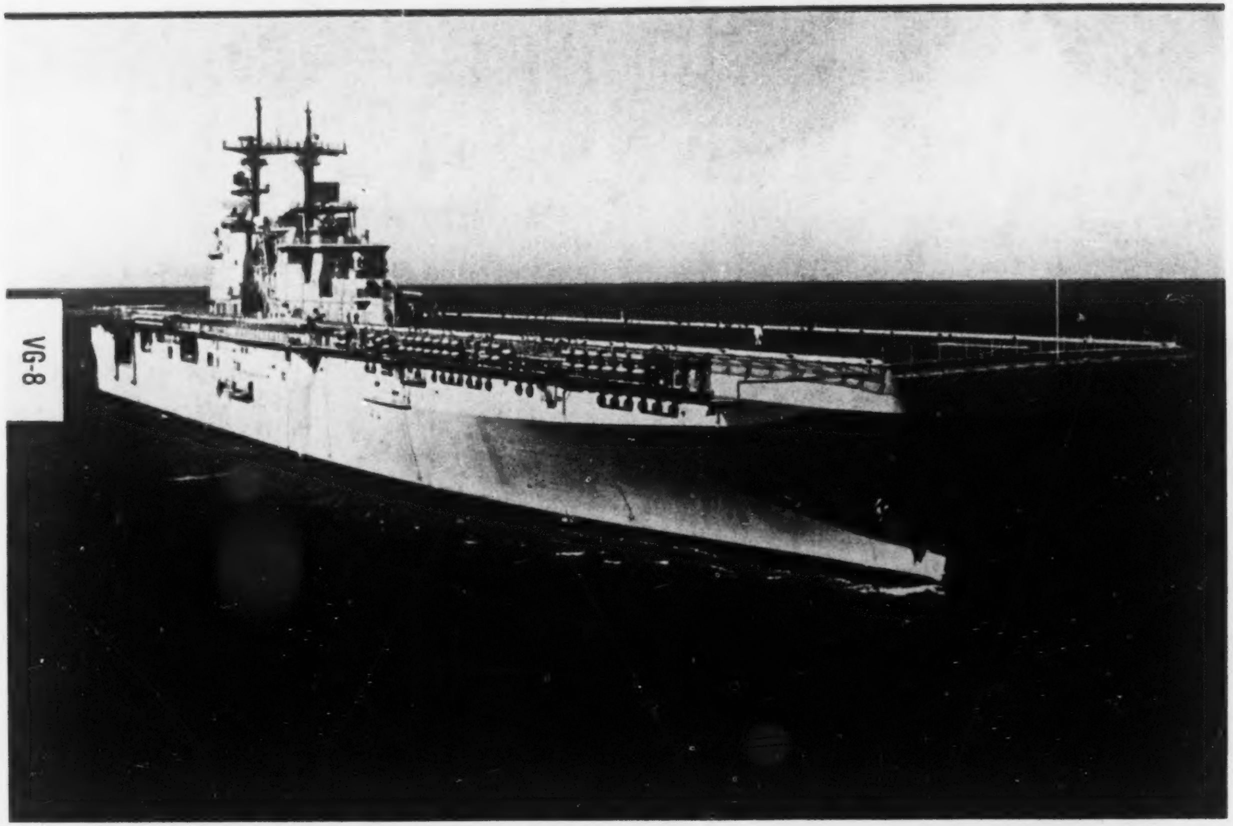
Nuclear-Powered Aircraft Carrier - 1989

GUIDED MISSILE DESTROYER - DDG 51

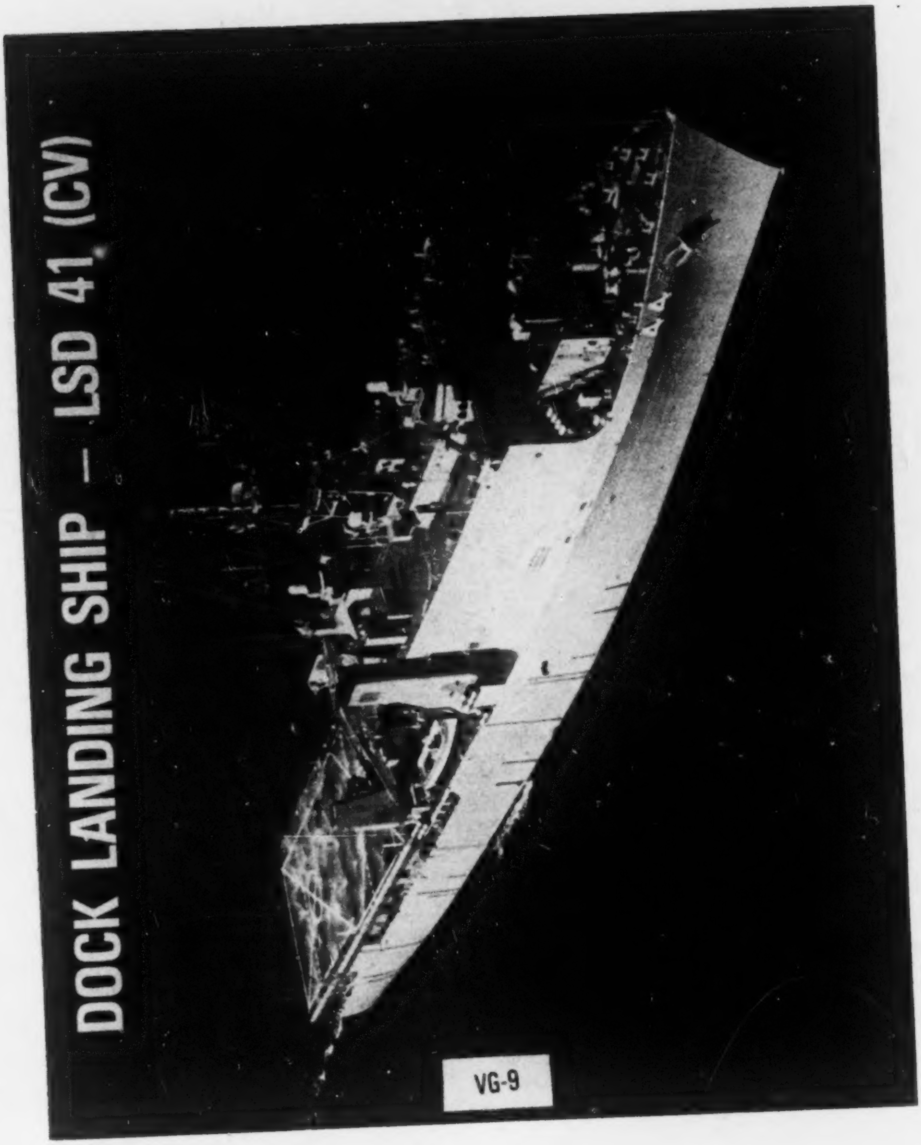


VG-7

AMPHIBIOUS ASSAULT SHIP WASP (LHDI)



VG-8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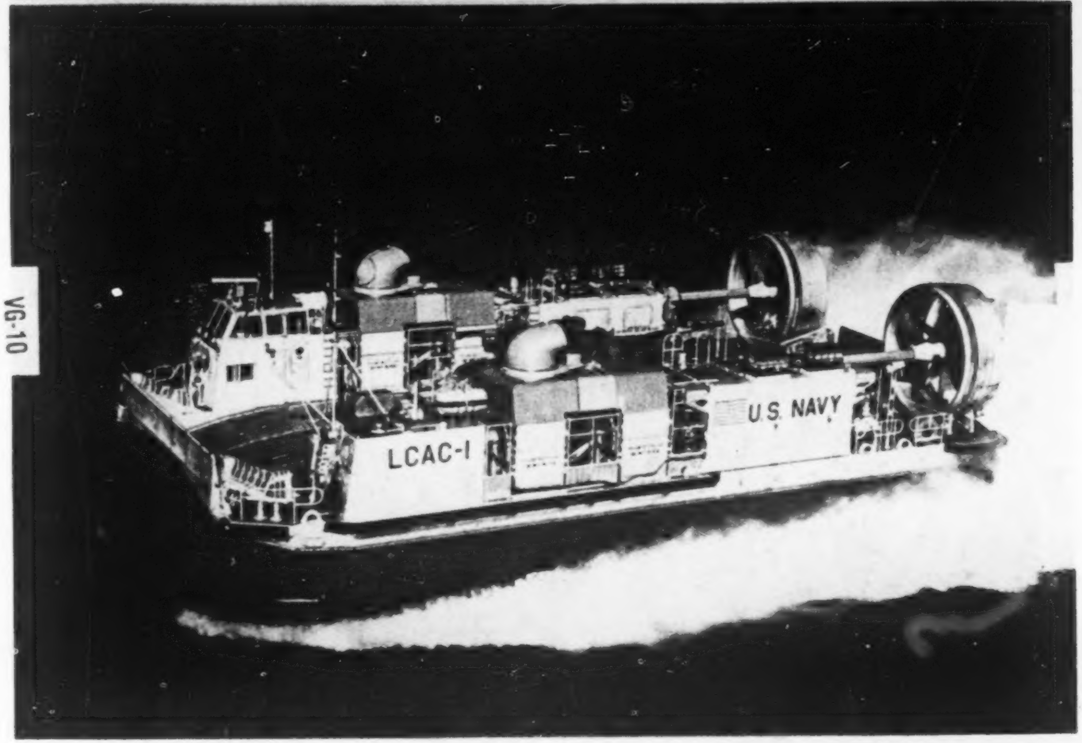
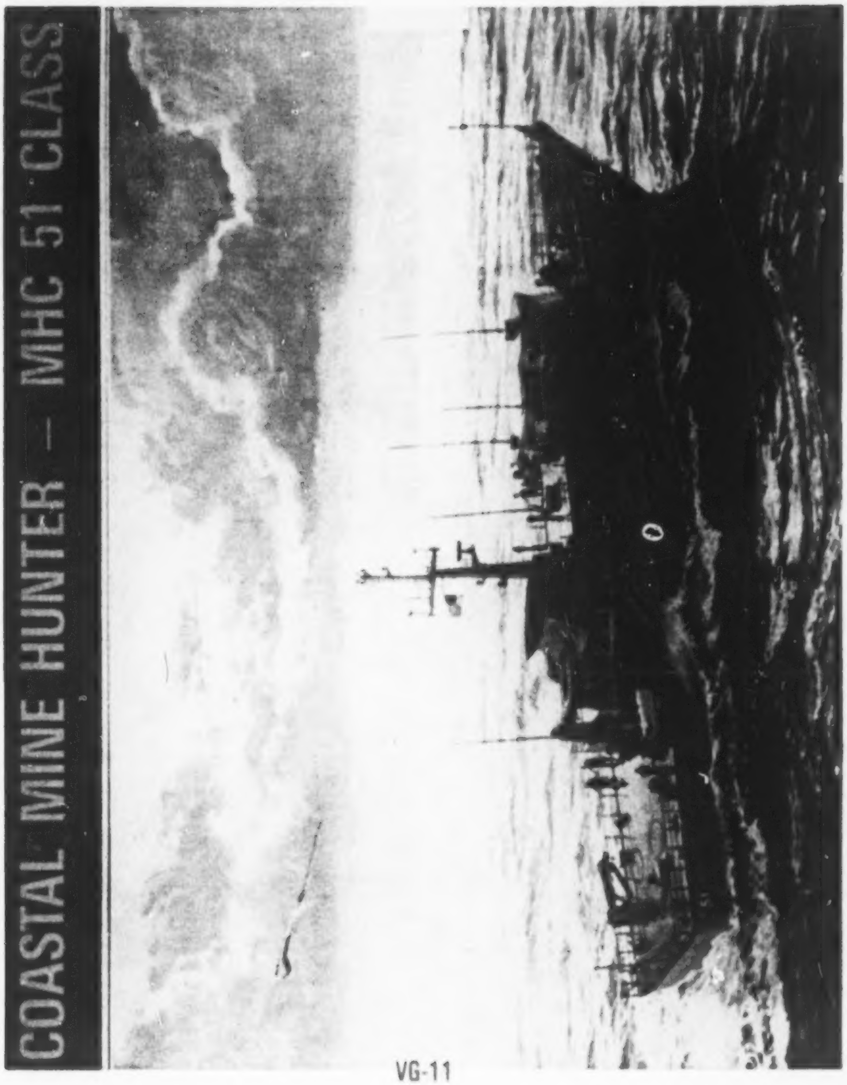
VG-9

LANDING CRAFT AIR CUSHION (LCAC)

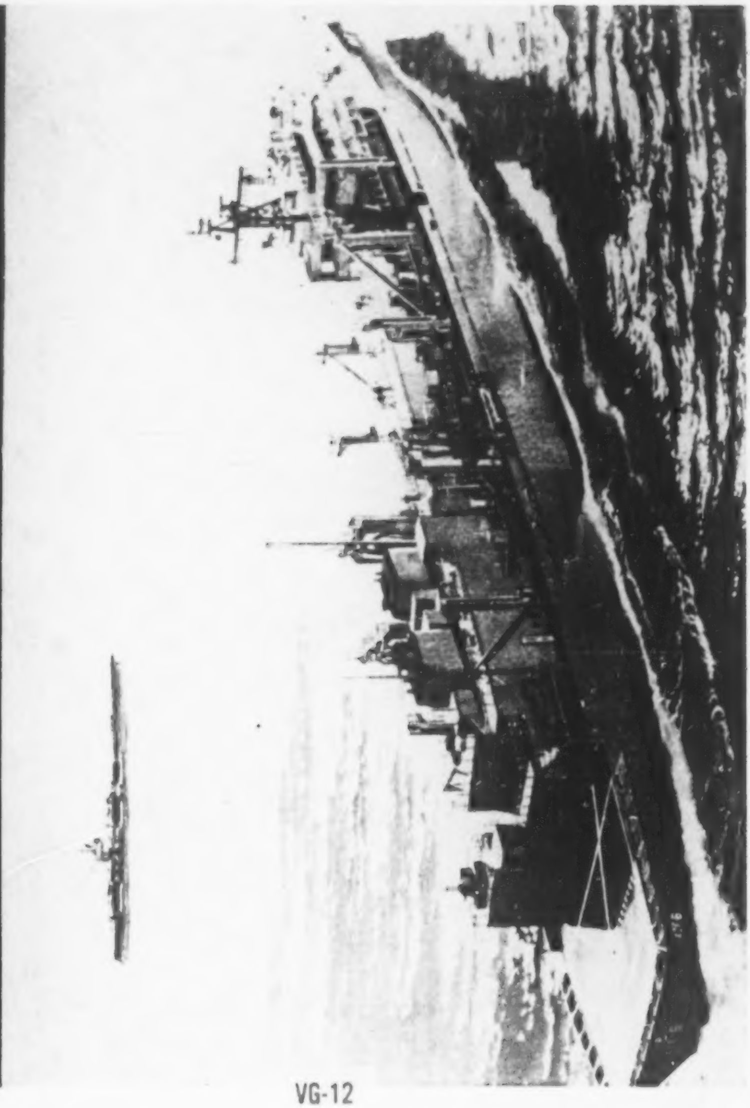

LCAC-I
U.S. NAVY

VG-10


COASTAL MINE HUNTER — MHC 51 CLASS

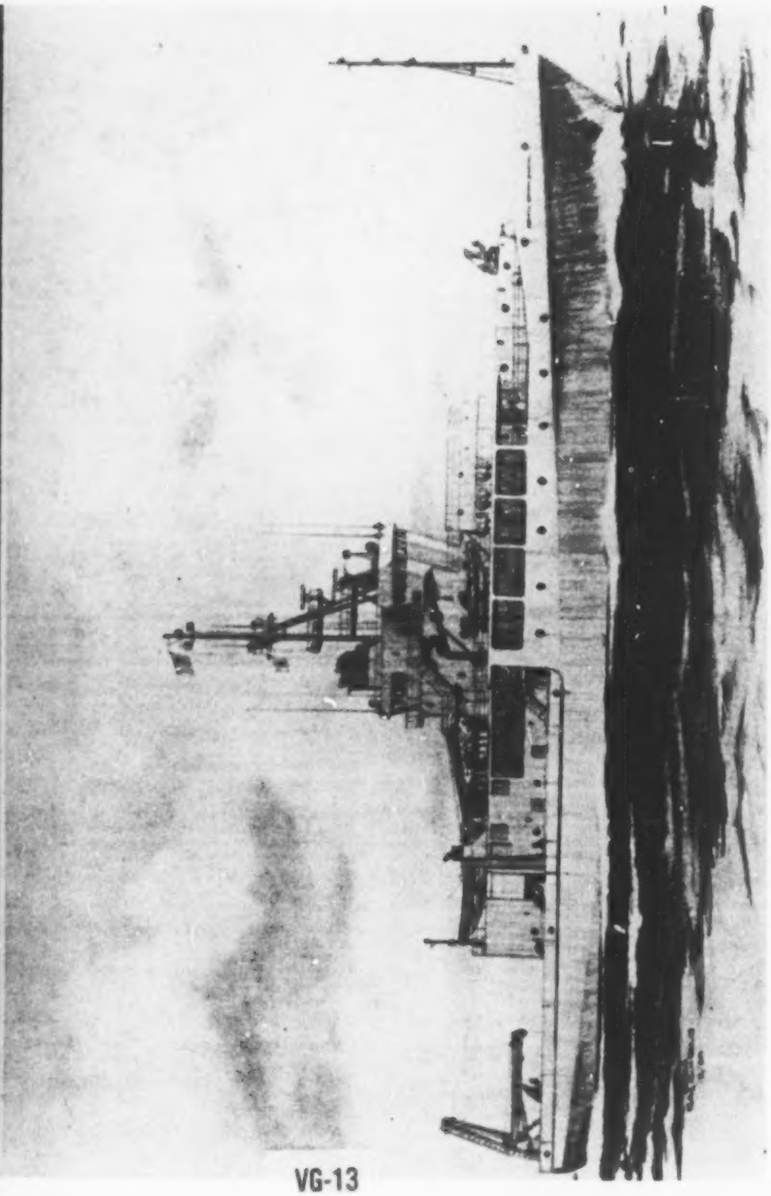
VG-11

FAST COMBAT SUPPORT SHIP AOE 6



VG-12

OCEANOGRAPHIC SHIPS



VG-13

Senator KENNEDY. Thank you very much.

We have seen, from what Secretary Cann and the earlier presentations that were made by the CBO, a rather bleak picture of where navy ship force levels may be headed. I do not know whether you have had a chance to review those charts. They indicated that buying the 600 ship fleet would require 5 percent in compounded real growth per year through the end of the century, funding that is probably out of the question given the defense budgets. Then if shipbuilding funds decline at the same rate as the overall budget, the fleet will be much smaller, perhaps as small as 390 ships. Missions obviously will have to be reconsidered.

So deciding to protect one mission area at the expense of another could have dramatic effects on certain components of the fleet. I am just interested in what your own priorities would be. What should we be expecting from the Navy in terms of its priorities given its missions?

Admiral NYQUIST. I think that so far the Navy's view of this has been that we want to maintain a balanced fleet. I think that with respect to what is going on in the Pentagon at the present time, a combination of these two warship studies I talked about earlier and the overall review of what we call POM 1992, leading to the 1992 budget, is certainly going to address the character and size of the Navy as we move out into the future.

My own view of some of this is that it would be very difficult to try to trade off in real time the one capability against another because, as we have talked, there are certainly a lot of submarines around, and there is a lot of so called Third World submarines, while not as dangerous in the open ocean, certainly do represent a major threat to shipping and to warships if you are locked up against their coastline.

So there are a lot of submarines around. I mean there is a total of well over 500 or 600 submarines of all types that are not U.S. submarines in the world. And with respect to power projection forces, we certainly need to maintain those forces. So in my—I think the view that is held widely in the Navy, and certainly is my view, is that we need to—whatever we do, we need to do in a balanced way. So the issue then gets to be what are we unable to do with those balanced forces?

Senator KENNEDY. Clearly, there is a dramatic alteration and change in the nature of the threat. Certainly, that is true about Western Europe. We all understand that the Russians are moving ahead. With the modernization of the SS–18s and the MOD–5s, they probably have a capability with half that will be equal to what they had with the total inventory previously, even under the agreements. They are moving ahead in SS–24s. They are moving ahead in SS–25. I think we all understand that. That is serious, serious business.

Certainly Eastern Europe has changed dramatically. There is a different threat. It is there, obviously, but it is different.

Admiral NYQUIST. Right.

Senator KENNEDY. I am just trying to get some insight as to whether you think with the alterations and the change that you have seen in terms of the potential re-supply in Western Europe (we had the numbers of attack submarines in order to protect the sea lanes for re-supply), whether that is going to necessitate the same number, or whether in the areas of priorities (which we understand the increasing capability with medium-range missiles that a number of the countries around the world have that could threaten our allies) whether the importance of maintaining a capability of force projection does not move up in terms of your own kinds of priorities. Or are we just going to have business as usual, i.e. cut back on each aspect of the Navy or put pressures on each aspect of it, with all of the implications that that can have.

What do we hear from you?

Admiral NYQUIST. Well, Senator Kennedy, I am certainly sensitive to what you are saying. However, I guess my view is that when all is said and done, we are still a maritime Nation. We depend tremendously on overseas trade and we are called upon to do various things. And if it turns out that whatever the threat is, it is disappearing and re-appears in some other form, the first issue will be how do we get whatever we need to back over to some other continent. And short of seeing a major reduction or elimination of one aspect of the threat, it would appear to people—those of us who are trying to put together systems for the Navy, that we need to maintain the proper balance in terms of being able to not only provide force projection, but provide area air defense at sea for the forces that are on the surface, and also to provide the capability that the SSNs give us in terms of going into denied areas to do whatever is required from a national strategy point of view.

I am not trying to evade your question, but to be very honest with you, I feel that it is a question of balance and it is going to be smaller, and the question is how much smaller.

Senator KENNEDY. Well, that is what I am asking you. That is exactly what we are asking you in terms of the nature of the threat. You say it is going to be smaller, and that is what we are trying to get. Are you just going to leave that up to the Members of Congress? As I understand it, we need everything, just as we did yesterday.

Admiral NYQUIST. I think that what will happen with respect to the Navy's efforts is that as the Secretary of Defense makes decisions over the summer, relative to the size of the Navy's budget, the Navy will be required to pull down whatever forces and other aspects of the Navy to meet that budget requirement. And I know that Secretary Garrett has testified on this issue and so has the CNO, and these issues are, frankly, about to be discussed at the Pentagon.

And I am really not in a very good position to discuss in detail what is going to happen, and I am not party to those meetings, in any event.

Senator KENNEDY. As I understand it, the press reports say that Secretary Garrett has argued to maintain the 14 carriers. What would you give up to be able to do that?

Admiral NYQUIST. Well, the Secretary has, I know, been in discussions with the Secretary of Defense over his views on the size of the force. And depending on—I mean, it is such a complicated question, I cannot——

Senator KENNEDY. Well, it is complicated. That is why you are here. That is what we are trying to find out from you. That is what hearings are all about. It is so complicated, we are trying to get your best judgment on it.

Admiral NYQUIST. Well——

Senator COHEN. Let me phrase it a different way, Mr. Chairman, and say if the committee were to fund just 12 carriers or less, what would be the Navy's priorities in terms of structuring its forces?

Mr. CANN. Well, with respect to the overall force structure, the issue that you are getting to when you get into the discussion about carriers, typically gets you into the number of escorts that are required and also the non-carrier surface action groups that are required. And it is really, fundamentally, a requirements problem, and a question of how you are going to use them.

And I do not want to appear to duck this issue, but my role in this is to try to produce these things, but perhaps Admiral Nyquist would like to make a comment on this subject. [Laughter.]

Senator KENNEDY. Pass that hot potato right down there, you and Admiral Cooper.

Admiral NYQUIST. In the fiscal year 1991 budget, Mr. Chairman, we are over here defending 14 carriers. And we certainly will not hide from the fact that we have said for a number of years that a 15 carrier force level is a fiscally constrained, prudent risk force. Fourteen is the number we have agreed that we are going to have to live with for the rest of the century. As we have gone further in, I cannot really talk to you about what our planning from fiscal year 1992 to 1997 is, but I could hypothesize if it is to be 12 carriers, then we, the Navy, and we, the defense establishment will have to look to see where we can pull back in meeting the commitments that we have met with 14 carriers for a number of years.

But if we did come down to 12, we would still need to come down in a balanced way, because as a maritime power and as the leader of the free world and as a superpower, we need balanced forces.

Other countries may be able to concentrate their efforts on sea control, for example. Some of our NATO allies concern themselves principally with ASW and that is fine. We would call on them to supplement our forces.

But just as Admiral Cooper said that submarines occupy both a role in power projection as well as sea control, so do the carrier battle groups. We have a balanced force. And I certainly would not want to leave aside the amphibious forces, which I believe we need to maintain. So if we do come down, we have to come down in a balanced way.

I certainly acknowledge that the Congressional Budget Office had as an option favoring one area of the Navy over another. But I do not think that we can do that, given that we are a maritime nation, given that we are an island nation and given that the history of the Navy—looking back as far as 1950 when the North Koreans crossed the 38th parallel, we had 11 carriers in the Navy.

The next year we were back up to 17. That is because we were retiring 5-year old carriers and we had the force level in people to sustain that. Today, when we retire a carrier, we are retiring a 40-year old ship, and when we do that we are saying that it is going to take us at least 7 years to replace that asset.

So, given where we are, it is an old cliche, but it is because it is true—it is going to be a come-as-you-are situation in which we are going to fight with what we have. So if we have to come down, in my view, we have to come down in a balanced way. And that is my answer to the question, Mr. Chairman.

Admiral COOPER. I would only add that a lot of these changes that you have seen have come since we had developed this particular budget that is on the Hill now. Over the last several months there had been lots of discussion go on within each of the services and those, in fact, are then submitted to OSD. They have the Defense Review Board and they are going through that sort of evolution.

One point I would make to you, however, is that a couple of decisions made late in the budgetary process, prior to our submission over here, were the decisions to de-commission several ships. For instance, in this year's budget you will see there are eight submarines. There are several surface ships that are being de-commissioned. They are being de-commissioned at a time that they were about to go into overhaul. We felt that after they got out of overhaul they would only have so many years left, and it was more economical, rather than paying for an overhaul in that O&M money to, in fact, de-commission them. And that is what we have done.

So those are some of the steps that we took early on. And now it is a matter of looking at the whole thing, as DOD is attempting to do in a very controlled fashion in, as Secretary Cann mentioned, the warship review that they are having right now, just like the aircraft review they had several months ago.

Senator KENNEDY. Senator Cohen.

Senator COHEN. Mr. Chairman, I can appreciate the words of caution that the Admirals and Mr. Cann are advocating here today. I do not think that we have taken into account what is going to be the impact of the loss of bases that we are likely to suffer around the globe. I am talking specifically about the Philippines, possibly Japan. Certainly Korea is going to be an area where Congress is going to want to re-visit this year, if not next, and what impact might that have if we are constantly shrinking back to Fortress America, what capability are we going to have to keep those sea lines open.

I remember on the Falklands, two nations went to war over some islands that had more sheep than people. Had the Argentineans been a little more patient and waited another year, the British would have retired their last remaining aircraft carrier, as I recall. The war might have turned out quite differently than it did.

So I think that even though threats diminish, here is a war that erupted over a long-standing feud on jurisdiction and could have, in fact, come out in a different fashion.

So I take your words to heart, recognizing that the Budget Committees are about to present us with a mandate that is going to look quite different from what you or many others would like to have.

I'm sorry to have to have you sit through all of that discussion of the DDG-51, but it has been of some concern to me in recent days.

I would like to have you comment, Mr. Cann or Admiral Nyquist or anyone else, about the issue of concurrency with the destroyer program.

Mr. CANN. About concurrency?

Senator COHEN. Yes. This was listed as a high concurrency program, according to the GAO. A statement was made that this program was inadvertently left off the DOD's list. That is news to me, because I found no one within DOD who inadvertently left it off the high concurrency list. But, nonetheless, could you talk about concurrency?

Mr. CANN. Yes, I would like to talk about that.

First of all, I was there at the beginning. I left, but I came back and so I know a lot about the DDG–51 program, and it was designed as a program as a follow-on ship to make maximum use of subsystems and other efforts that had already been fielded, primarily in the CG–47 class cruiser. What you are accruing in the DDG–51 are all of the benefits of a very carefully structured program that went over 20 years to field the CG–47 program. The propulsion system is essentially common with the CG–47, the Aegis AAW system is essentially common with improvements. Of course, improvements are a fact of life. So you have improvements in any ship as you move it along. But everyone of these things has been well tested as it has moved throughout.

I was a little bit surprised at the comment that was made about the data multiplex system this morning, because before I left the Government in 1985, I think it was in 1984, we tested that digital multiplex system in another ship. I believe it was the *Hewitt,* was it not?

So, it was tested at sea, and that was a product of a long-term effort at the Naval Ocean Systems Center that had gone on for many years to demonstrate the efficacy of that sort of a system.

Senator COHEN. That is an internal communications system, is it not?

Mr. CANN. That is right, to carry——

Senator COHEN. When you say data multiplex, it means you can have more than one signal on one line.

Mr. CANN. Well, you put various ship functions on it and you multiplex them around, instead of drawing wires for each one. So what it does is it eliminates a large number of wires that have to be pulled in the ship, and it is a—practically all modern communication networks internal to buildings and other places are now going to data multiplex systems.

So I was surprised by that statement, because in my view, the concurrency issue is, I think, not a valid issue.

Senator COHEN. Does the Navy still expect the DDG–51 to come in under the projected cost?

Mr. CANN. Yes, we do.

Senator COHEN. And could you tell me whether or not it is the Navy's position to bail out Bath Iron Works? That phrase has been used in an internal memo from the subcommittee staff to the chairman of the House subcommittee.

Mr. CANN. What I would like to do on that question, since I am relatively new back to the building, I would like to ask—I brought the Commander of the Naval Sea Systems Command with me, Admiral Hekman. I would like to have him answer that question.

Senator COHEN. Before he answers that question, what about stealthy characteristics on surface ships. Is that greeted with laughter amongst most experts?

Mr. CANN. Let me address that issue. It is very, very important to do all we can do to reduce the cross-section of ships. There are obvious reasons for doing this. And without getting into anything classified, if I can make the appearance of a surface ship smaller to a radar system, it certainly makes it—they have to get closer. That is the first issue. The second issue has to do with your ability to defend yourself. And I could get into this, but I would rather get into it in a closed session.

But we take the business of reducing the signature of surface ships to be a very serious issue in the Navy.

Senator COHEN. Admiral Hekman.

Admiral HEKMAN. If I understand the question correctly, Senator, this has to do with——

Senator COHEN. Trying to bail out Bath Iron Works. That is the question.

Admiral HEKMAN. Yes, with the ECP. The original award of April 2, 1985, had two separate line items in it. One was for detail design and the other was for construction. And each had a share ratio which shared risk between the Navy and Bath Iron Works, and each had a target-to-ceiling percentage that we would share in this risk, accepting the fact that this was a rather high-risk developmental program.

A group of changes to the ship's specifications were made by the Navy, and in mid-1990 Bath Iron Works came forward with an engineering change proposal which was priced out at the target price of $34.7 million to cover these Navy-driven recommendations.

Senator COHEN. The Navy made the recommendations after the initial contract.

Admiral HEKMAN. Yes, sir.

Senator COHEN. And Bath came back and said, if that is the case, then we will need the following amount of money to cover that.

Admiral HEKMAN. The Navy modified some of the specifications. Bath Iron Works then came back with the engineered recommendations and what the cost would be for those, normally done in this manner.

Senator COHEN. But you initiated the change and the specifications.

Admiral HEKMAN. Yes, sir. We did.

We looked at these. We thought that Bath Iron Works had a very good position on these. We, after six months of consideration of just this ECP, which combined a number of very small items as well, we came to an agreement with Bath Iron Works not only to settle on their price, which we thought was fair. But we also, at that time, re-adjusted the contract into one line item, where we, the Navy, more equitably adjusted the risk factors involved in the contract.

The Navy's objective was to equitably adjust this contract to pay for additional effort. We were not making any attempt to give Bath Iron Works any adjustment in what we felt was a fair and equitable settlement for the work that had to be done.

Senator COHEN. Were the problems not generated by a 3-D computer design program, which the software was not in existence or perfected at the time the contracts were originally signed? Is that not where some of the delay came about and some of the problems?

Admiral HEKMAN. These were basically driven by the specifications in terms of radar, susceptibility and some of the engineering changes—for example, the insertion of the closed system within the ship. That required additional design work, and also additional construction.

Senator COHEN. The point is that the Navy made the changes, and Bath——

Admiral HEKMAN. The Navy changed the specifications, yes, sir.

Senator COHEN. Thank you, Mr. Chairman.

Senator KENNEDY. Senator McCain?

Senator MCCAIN. Thank you, Mr. Chairman.

I just said to my friend from Maine that I am glancing at this very un-professional memorandum filled with rhetoric. Again, I am always puzzled that the Energy Committee has played such a key role in acquisitions of our Nation's defense system. I know that Energy is involved, but I never knew that they would play the dominant role that they do. [Laughter.]

Mr. Cann, you are in a very tough situation because you are here defending a fleet of about 585 ships, when information has been leaked to the media that there are high-level discussions concerning 488 ships. Is that correct?

You are in a very difficult position, are you not?

Mr. CANN. Well, there are all sorts of proposals on the table up there in the Office of Secretary of Defense at this point. Some have been generated by the Navy; some have been generated by the various staff people up there.

Senator MCCAIN. And I appreciate your and the other witness' defense of each of these weapon systems. I think they are very cogent and compelling, and I agree with the statements of my friend from Maine that we clearly have to have a strategy which could be described as rapidly deployable and capable of defending our lines of communication and trade.

But the problem is that you are driven by budget numbers as opposed to an assessment of roles and missions and threat.

So, I appreciate your testimony here today, but it is unfortunate that it is not driven by the real numbers, which will be the final proposals made to this committee by the Department of Defense.

So, Admiral Cooper, I would just like to talk just for a minute about the SSN-21. You mentioned the production—Soviet ship production. Do you think that it is also appropriate to mention that large numbers of Soviet ships have been taken out of commission, that the Soviet operating forces, particularly in the Pacific, have drawn back to operating areas very close to the Soviet Union as opposed to the far reaching and maneuvering areas that they had employed for years?

And we have strong evidence that the Soviet Defense Budget is being dramatically reduced. Do you take issue with any of those statements?

Admiral COOPER. I cannot take issue with the specific sentences you used. I would like to put my little clarification on it, if I may.

One, you talk about the reduced budget. I cannot talk about comparing rubles to dollars and comparing the budgets. I can merely tell you what I see. And what we saw last year were, in fact, nine submarines that they built.

If you remember last year, Mr. Aspin had a special committee set up to determine if, in fact, the SSN-21 was going to be capable of off-setting the improvements that we physically saw in the submarines they were building. And the fact is he decided yes, the SSN-21 could. The SSN-688 would have a very difficult time. But the submarines that they were developing, the *Akula*, the *Victor III*, the *Oscar* submarines were extremely capable and much quieter than we had seen in previous classes.

That then takes me, and I think I stated in my statement the fact that they were, in fact, de-commissioning or had so announced that they were going to de-commission several of their submarines. The fact is the ones they are de-commissioning are either their first classes of SSNs, the *HENs* class, the *Hotels Echos,* and *Novembers*. Those classes do not operate well. They have always been a very great material problem to them, and you saw last year a picture of one of them on the surface with a lot of smoke coming out of it. It was towed back to port.

Those are the submarines they are de-commissioning. The fact is the ones that are coming on-line are very, very competent, and they are, in fact, so far, building at a higher rate than we are. As far as their operations go, yes, we have seen a pull-back in the types of operations they are doing. However, the potential is always there for these extremely competent submarines that we have observed to be very competent and to be very well operated.

Mr. CANN. Senator, may I make one comment?

Senator MCCAIN. Go ahead, yes.

Mr. CANN. With your permission, I have to again make—maybe I did not make the point very well before. I would like to try to make the point again that I made before.

We are really talking on two different levels. One level has to do with the view of the world and the total force structure and the rest of it. I happen to be in the fortunate or unfortunate position, depending on one's view, of the person who has to produce the systems. And what we are trying to do, is we are trying to make a decision over a very short period of time, when you look at history, as to what to do with the Navy.

We have a unique situation, that Navy shipbuilding, including submarines, is, again, a one-client kind of a business. And if we make a decision, unilaterally, this year to reduce the number of shipyards or reduce the number of submarine-building yards and so forth, we will probably not be able to re-constitute that if we need to do it in a rush.

And I guess that what I would hope that everybody would do, would be to watch this process a little bit and make sure that we maintain the industrial base we need so that if somebody in a couple of years decides that well, it really happened, and there is no more threat, then we can start to fold it up. But I think people need to make sure—I want to make sure that everybody understands that we cannot turn this stuff on and off.

Senator MCCAIN. I understand that, Mr. Cann, and I expressed my sympathy for your position when I began my questioning.

But I also think that you stated the crux of the problem. Your responsibility is production. Somebody has got to be responsible for the threat and the mission, and the assessments which then drive your decision-making process, which frankly, I do not think you are getting at this time. And I certainly do not fault you for that.

Admiral Cooper, what is the overall cost of the SSN-21 as the Navy envisions it today?

Admiral **Cooper**. We see it as the first one in 1985 dollars, which is the one to which we have said was the ceiling at $1.6 billion, and the follow-on, which would be the fifth or sixth submarine, to be approximately $1.1, I believe. Possibly——

Senator **McCain**. That is 1. And what is total program cost at completion of production?

Admiral **Cooper**. I cannot answer that. I will get it for the record. I do not know what—of course, it depends on the number of submarines that we buy, and I just cannot tell you right now what that is. We are going through the warship study right now. There has been a statement of 29 being the final, ultimate cost. And that was laid down by somebody, sometime. And I just cannot answer the question. But I will get you an answer for the record.

[The information follows:]

The total cost of the *Seawolf* program, assuming a 29-ship baseline and procurement at the rate requested in thc President's budget, will, be $48.7 billion. This total includes SSN-21 and BSY-2 development and procurement costs. It should be noted, however, that procurement of follow-on SSN-21s at a rate which is less than that requested in the President's budget will change the economic and production factors on which this cost estimate is based and could increase the total program cost.

Senator **McCain**. I would hope you would be able to tell us how many you think you need.

Admiral **Cooper**. I would say right now that we need a number that would get us between 80 and 90 for a total level. And so, you run that out. Eventually, I would assume that after 15 years or so, just as we have in previous times, we would be working on another submarine.

Senator **McCain**. Thank you very much, Mr. Chairman.

Admiral **Cooper**. Thank you.

Senator **Kennedy**. Senator Exon.

Senator **Exon**. Mr. Chairman, thank you very much.

I apologize to the witnesses and to the Chairman and other members of the committee for having been gone. We just finished our markup over in the Commerce Committee.

Gentlemen, I think you heard my questions early on of the first panel of witnesses. Let me phrase this question a little bit differently, but essentially along the same lines that I have asked the previous witnesses before this subcommittee and the committee as a whole.

Given the very important role that the United States Navy has in the strategic and conventional posture of our national defense, and given the various programs we have underway, what would you think would be the three top priorities? Would you comment on that, Mr. Secretary?

Mr. **Cann**. It is not difficult to do that. I think that maintenance of our strategic deterrent has got to be one of those three.

Senator **Exon**. So that would be the Trident, right?

Mr. **Cann**. Yes, sir.

Senator **Exon**. The next two?

Mr. CANN. Another one is, certainly, to be able to maintain the sea lanes, which includes power projection. In other words, in order to make sure that we can secure the sea lanes so that we can do power projection if we have to.

Senator EXON. What system would best fit that category?

Mr. CANN. Well, that would include—unfortunately that includes several systems. It includes the carriers, it includes the battle groups and it also includes submarines. I mean that is the way in which we tend to go at that process. And the third one, I would say, is to provide adequate sealift, so that we can either re-supply or take our own troops over to wherever we have to go.

Those are the three sort of historic missions for the Navy. I believe I have characterized them properly.

Senator EXON. My only comment to that, Mr. Secretary, is that that is not very helpful to those of us on this side of the table. That is one of the problems that we have. Once again, I emphasize that when I ask the question, I do not mean to imply that there are not other things——

Now, you cannot be any more specific in answer to my question than you have been so far?

Mr. CANN. We had a little bit of this discussion while you were out with your markup. But let me say, it is a very difficult proposition. And I realize that it is difficult for you. It is difficult for us, too.

The issue is that until somebody is able to show a clear diminution of threats to the forces at sea, one needs to be prepared in a balanced way to support whatever the national will is. It is clear to me that the size of the Navy is going to come down if the budgets come down. And I think that right now the Navy's posture for doing that is to take the cuts in a balanced way. And I think that the strategic force is certainly looked at separately, but it is a very important issue within the Navy. And we are going to get a lot of direction this summer from the Secretary of Defense on the size of the budget and on issues like the DDG-51 and SSN-21, and I am sure we are going to have a lot of discussion about the actual size of the Navy. And that is all about to take place over the next 3 or 4 months.

Senator EXON. Any of the admirals care to go out on a limb on these programs? Aside from your own prime responsibility, what program do you think is the most important?

Admiral COOPER. I would merely say the two of us here are certainly responsible for the things that he talks to—the things that Mr. Cann discusses here. Each of us has a portion in those particular items. So it would be difficult to say anything further, I think.

Senator EXON. Well, let me ask this question, then, possibly of you, Admiral Cooper.

You heard our earlier discussions and questions about the *Seawolf*. Now, I have always been a very strong supporter of the *Seawolf*, I think that you know. Can you give us your view as to whether or not, if we proceed on some rational, reasonable basis to procure the *Seawolf*, would the *Seawolf* significantly lessen the number of submarines we would have to have deployed because of the superior techniques and technology incorporated in the *Seawolf*?

What I am trying to say, is the *Seawolf* enough of a leap ahead into the future that one *Seawolf* might do the job of two or three other older-type submarines?

Admiral **Cooper**. And the answer I would give you, is yes.

Now, I would like to go on, if I may. The man from CBO, in discussing it, I think answered it quite well. And I think he agreed that yes, the capabilities across the spectrum, the many different things we ask for, whether it is stealth or firepower or mobility or endurance, in all of those things, the *Seawolf* is, in fact, better than any other submarine in the world.

Now he also brought up the point, however, there is a certain point at which you have to have numbers. And so when I look at two studies that we have had done, one in 1984 and another one in 1989, we looked at that very specifically. What did the *Seawolf* give us that would allow us to look at force levels? And we were looking, of course, at the threat as we saw it at that time. Which the threat, as we see it today, is slightly less, but as I tried to indicate, it is a very real threat in the submarine ASW world.

As we looked at those two studies, it came out with a certain number of submarines needed, without the *Seawolf*. In other words, the one we did back in 1985 and 1986 was looking at, specifically, SSN-637 class submarines which we have right now, SSN-688 class submarines, and also the improvements which we were going to make so that we would have what we have now, the SSN-688-I. And when you took those together, we came up with a certain number. And the number that we came up with, which we felt we needed, was approximately 140.

We then looked at the threat about a year and a half ago, and said okay, now, we would expect to have some number of SSN-21s in about 2000. And when we did that, we came up with another number, counting on the fact that we would have 10 to 12 to 15 SSN-21s. And at that point, we came up with a number of about 106. Now, what that tells you, is that the SSN-21 can do a lot of things and can do them better than the SSN-688. That also is the number that I can justify.

When you come into budgetary constraints, then, obviously, the number is going to be less. But when I have to look at the threat, as the senator stated earlier, as I have to look at the threat and determine what it is I need to take care of that threat in ASW, then I have to look at the whole thing, and I come up with a certain number—I do not. I try to go to the smartest people I can find to come up with a certain number.

Does the SSN bring more to the table? Absolutely. Does it allow us to have lesser numbers? Yes. Obviously, the major thing is going to be the budgetary constraint as to the number of submarines we can buy.

Senator **Exon**. Let me follow up on that point, and I would ask you to comment on this, Admiral Cooper, and possibly you also, Mr. Secretary—whichever one wants to handle it.

The Navy, of course, is requesting $178 million re-programming requests for the lead boat in this area. According to the Navy, the cost increase was due to "unexpected changes in economic factors such as the labor rate escalation and increased cost of equipment due to higher quieting standards."

Could you be a little more specific, and maybe break-out for us what this $178 million re-programming costs are in terms of whether, primarily, the increases were the responsibility of the Government, the contractor or simply poor economic projections and assumptions.

Mr. CANN. There were several factors that brought this about. First of all, the quoted man-hours were on target. The escalation rates that were originally used through the OSD/OMB projected rates turned out to not be the actual labor rates. And so the labor rates were one issue.

And then there were quotes for shipbuilder-furnished material and equipment which were also higher than the estimates. The SSN-21 quieting requirements are significantly more stringent than previous attack submarines, and the original material cost estimates were based on evolutionary development of the SSN-688 equipment. The significant number of components required greatly increased levels of precision manufacturing and technology, and went well beyond the evolutionary development of the SSN-688 equipment.

The material costs rose to comply with the stringent specification. After an exhaustive 5-month effort to reduce overall cost, there remained a $178.8 million shortfall. The SSN-21 lead ship was awarded on January 9, 1989. After that review, they had a favorable competitive bid, and it was awarded. While the bid exceeded the amount budgeted for the SSN-21 basic construction, there was sufficient unobligated funds within the amount appropriated to make this aware.

Subsequent to that, there were a number of issues of how to get the funding back. And at one point we were going to go through the ship cost-adjustment line to get it. But I should point out that it was a competitive bid to award the contract in the first place. And even with the $178 million request for re-programming, the overall cost of the ship at this point is within the 1985 cap that was applied at that time. So, we are still within the $1.6 billion that was estimated originally for this program back in 1984.

But I think what you are seeing is that the competitive aspects of the program brought the bid in at a low price without understanding some of the issues. Then there were subsequent changes in labor rates and some other things that put the thing up to the amount that was the original estimate in the first place.

Senator EXON. Thank you, Mr. Secretary. Thank you, gentlemen. My time is up, Mr. Chairman. Thank you.

Senator KENNEDY. Senator Lott.

Senator LOTT. Thank you, Mr. Chairman.

Admiral Nyquist, your statement specifically identifies the goal in amphibious warfare ship levels to be able to lift both a Marine Expeditionary Force (MEF) and Marine Expeditionary Brigade (MEB).

You further state that four LHDs are fully funded, and that your 1991 request includes money for LHD-5. My question is, will five LHDs achieve the stated goal of lifting a MEF and a MEB?

It was my understanding that we were going to need two more of these LHDs, and I was very much concerned when I saw an article in the Washington Post that did not include another LHD in the POM.

Admiral NYQUIST. Senator Lott, like the major warship review is looking at the SSN-21 and the DDG-51, we are also looking at the total force-level picture and the total requirement for lifting the Marines. So I—the issue of how many LHDs we will eventually procure is going to depend on those force-level issues that we are taking a look at right now and the development of the defense picture for fiscal years 1992 to 1997.

So I do not mean to duck that question, but the whole force-level issue is going to be under review. So I—specifically, yes, you are correct that you need more to do that specifically, but we are taking a look at all of those force levels.

Senator LOTT. Well, if your goal is to be able to lift both a MEF and a MEB, you cannot do it with five LHDs. That is my understanding.

Admiral NYQUIST. You would have to take a look at other ways to achieve that lift if you did not build the LHDs. But as I say, we—you know, the whole Navy force-level issue is going to be under review in the POM 1992, so what the results of that will be, it would be premature for me to speculate.

Senator LOTT. Well, it would be my expectation that your POM 1992 through 1997 would include additional funding for LHD construction.

Now, I have not been here for the whole hearing today, and I understand that you, and other admirals are under the gun—you work with the administration officials, the Secretary of the Navy, Assistant Secretaries of the Navy as well as the Secretary of Defense.

But I want you guys to know that if you come up here and are hesitant in what you say to the Congress, whether it is the authorization committee or Appropriations Committee, you do not help your cause; you kill your cause.

And I think the Navy ought to come in here and say this is what we need to do the job, this is what we are asking for. It ought to be backed-up by the Secretary of Defense, and then if we are crazy enough to cut that, then that is our fault. This is just like everything else—if we come in and start cutting everything across the board, and we cut because of dollars, without paying attention to the mission, Congress bears the responsibility and the result will be a major travesty.

Mr. Secretary, would you like to get into this LHD and the POM 1992 to 1997 question?

Mr. CANN. Well, the only thing I could say is, frankly, we are up here to discuss the President's 1991 budget, as you are aware. The whole subject of the 1992 through 1997 POM has, at this point, not even been discussed inside the Pentagon. And, unfortunately, as much as I would love to sit here and discuss with you these issues as to what is going to happen, I would be very honest with you and tell you I do not know what is going to happen.

Because, with the reviews that I see going on at the Pentagon at this time, it is clear to me that there is going to be enormous changes made, not only to what needs to be lifted and how it is to be lifted, and also what the size of the warships are, as well as the lift capability of the Navy, and if we were having this discussion 3 months from now, in September, I would certainly have a lot more information.

Senator LOTT. Surely you realize that in the so-called review, everything you put on the table Congress will gobble up. So I hope that you all would be very careful about these reviews and your POM. If you cannot do it internally and keep it internal, maybe you ought to find some other way of doing business.

But let us talk about 1991. Mr. Secretary, several weeks ago you appeared before the Senate Appropriations Committee and stated that the United States does not need additional sealift capability. I found that very surprising since everybody that I have questioned this entire year, every CINC that has come in, I have asked the question, "Do we have enough sealift capability today?" The answer has been almost universally, "no, we do not."

In that connection, of course, we have had some re-programming. Thursday, the DOD Comptroller agreed with Congressman Murtha to re-program only a portion of the $592 million originally appropriated for sealift. That leaves $375 million for sealift procurement in fiscal year 1990. Are we going to make use of that money, and how many ships can we buy with that amount of money?

Mr. CANN. Well, first of all, in fiscal year 1990, the Congress did appropriate $600 million for shipbuilding and $15 million for R&D. And that money, essentially, never reached the Navy. It was held in OSD and has been used, as you recognize——

Senator KENNEDY. I think it is on its way to Panama, Senator.

Mr. CANN. That is right.

Senator LOTT. Part of it is going somewhere, but that still leaves some.

Mr. CANN. But at the present time, that money is not in the Navy's hands.

Senator LOTT. Let me ask you the original question.

Do we need additional sealift capability or not, in your opinion?

Mr. CANN. Well, let me tell you how I see it, right now.

When I came back aboard, into the system a couple of months ago, getting ready for these hearings, I got into the whole question of sealift. I took a look at what we have done, and over the last 10 years we have put $7 billion into the sealift issues, and have come out with a number of ships. And you know what they are.

Based on the 1988 scenarios that were generated for lift, the Navy meets the sealift requirements, minus about 15 percent in roll-on/roll-off (RO/RO) capability. At least that is the way that the analysis all comes out, and at the present time, depending on how things change, we may or may not have more requirements for sealift in the future.

But according to the analyses that I have reviewed, and the discussions that I have had inside the building, with the exception of a certain amount of RO/RO capability, the sealift requirements as currently stated have been met. Now maybe Admiral Nyquist can add some additional clarity to this discussion.

Senator LOTT. Admiral, how do you respond to that?

Admiral NYQUIST. Well, as you know, Senator, there were two pieces of this last year. One was R&D, $15 million, and the other was the $600 million.

$15 million R&D also is not available to us, but in the meantime, we have gotten off, I think, on a good foot on getting all of the players together, including the ship owners, the NAVSEA ship designers from Admiral Hekman's shop, our requirements people, MARAD, and they have sat down and mapped out a way ahead to build the kind of ship that is economically viable to the owners and one that could be then used to make up that deficit in unit equipment or that conversion.

So I think we are off to a good start, particularly in getting MARAD, the shipowners and the Navy side together and we are hopeful that if we do get that R&D, that we will put together a program that will lead to that kind of ship, and at least design the characteristics of that kind of ship.

So, that is where we are now. And we are awaiting the results of those funds coming off a deferral list.

Senator LOTT. I thank you for your tolerance, Mr. Chairman. I also thank you for your support, last year, for the sealift funding.

Let me just conclude with one question. Is there anything any of you feel passionately about this year? [Laughter.]

Is there anything you are willing to fight for, resign for? I mean, what is important to you—is it destroyers, LHDs, MHCs or is it sealift? What really matters with you all, this year?

Mr. CANN. Well, I will tell you what matters with me. Several things matter with me. First of all, with respect to performance, I think it is very important that we recognize that we are here today with the kind of Navy that we have because we put the money into quality. And the two ships that have been up for the most discussion over the last several months are the SSN-21 and the DDG-51. The reason we have got such a successful submarine force is that we have paid for quality through the years. And I do not think that most people appreciate the importance of the attributes that the SSN-21 will have with respect to its ability to operate in the post 2000 time frame relative to whatever anybody else can do. And that is a very important point. It is going to be a significantly quieter submarine than the SSN-688. That is a very important point.

The DDG-51 has got some other characteristics. It has got the best combat system ever put on a surface ship by anybody. We have a program to get it further down the road. We are giving it characteristics to protect itself against cruise missiles, in terms of its signature reduction and so-forth. So, those are two aspects of it.

The other aspect that I feel very strongly about in this whole debate is the question of making sure that we do not unilaterally wipe out our industrial base before we understand where the threat really is and where it is going. And to that end, I would like to make sure that we have some options available to maintain the production of these ships as they move down the path.

Senator LOTT. I think I liked your remarks about the DDG-51, so I think I will quit while I am ahead.

Mr. Chairman, thank you. [Laughter.]

Senator KENNEDY. We have run into these situations where, in this panel this morning, you really basically want everything to just continue. You see, part of the frustration that I have with this process is that you ought to be asking us, what do we want to defend. We are the peoples' elected representatives. And you say to us, what do you want to defend, and we will tell you what is necessary in terms of the U.S. Navy. And if we are wrong, you lose your life and we get defeated.

But that is what this whole process—civilian control over the military, the Constitution—is all about. We are into a situation where we are trying to find out if you have X, we can defend Y. We get that amount of money, and this is the way we are going to do it. We are going to need those submarines that are going to have deterrence. We are going to need force projection. We are going to have a new assessment in terms of what the re-supply needs in Western Europe are.

Then we have some kind of idea how to operate. We are generalists. We are all generalists on this. Some of us spend more time on these issues than others. But what ends up is that you get what you ask for. This is everything, and then we are just going to exercise what our own judgment is, and you are the experts.

Mr. CANN. Well, we want——

Senator KENNEDY. Well, we will go to another day. I want to get to final questions. I am glad to have you give whatever response. That is fair enough.

Mr. CANN. I just wanted to say that we certainly want what we asked for in the 1991 Budget. The issue of how many of all of the rest over the next several years, I would just like to be able to tell you what that is, but I cannot.

Senator KENNEDY. You know, with all respect, that almost insults our intelligence, because since the 1991 budget has been set up, the world has changed dramatically. It has changed. You read the papers, you see this. You are in contact with people who are dealing with this. Just say—this is the third time. I mean, I have let it go by twice. It was said that we are just up here to defend what was suggested last year for 1991. Well, I have let that go by twice.

He cannot really be thinking that, what with the changes since the time that budget was developed. We can leave it at this—I mean, I am just venting what has been expressed by others with a degree of frustration. But you really insult our intelligence not to be able to come up here, when we are coming in and trying to make some sense out of this and still be defending a budget that was set up when you had an entirely different kind of condition.

That is my sense about it, and what you do is you get yourself into an impossible position. I mean, you make a poor case for an unreasonable kind of request. That is the way I read this part of it.

I mean, you summarize what we are going to have to do in terms of the priorities. We are going to have to make the recommendations on that to the Committee, to the floor. Based upon what you are telling us, we are just up here today defending this budget from last year that was established at a time when we had a different kind of world condition. I mean, that is the bottom line on it. I understand what the situation is.

I would just like to get into a final couple of areas. Concurrency. We have to deal with, one, the nature of the threat, mainly for our security.

If we have at least some adjustment and modification in terms of the threat, Admiral Cooper, how would you rate the performance of the improved SSN-688 to the best Soviet submarines. If you have to be a captain in one of them, which one would you rather be a captain in?

Admiral **Cooper**. SSN-688—the improved SSN-688.

Senator **Kennedy**. And would there not be a much less cost and performance risk if we waited to begin the building follow-on SSN-21 submarines for another year instead and build improved SSN-688s?

Admiral **Cooper**. I think that would not be a wise move. The SSN-688 that we have, it would cost money to get back into. You would not get it at the same price that we have gotten it. There is no improvement we can make to the SSN-688.

The SSN-21 is there; we can make improvements to it. It is the submarine that we need. We have been working on it 8 of 13 years in the program. I do not think that there is anymore that we can do to make that any better. And I think that the concurrency is something we have always had, particularly in submarines. And as we build it, when we finally get to the end, then we will make sure that everything works.

Now, a final point that I would make and it is a very simplistic point. But the fact is that it takes a long time to make this. You are making a truck. And as you make the truck, you put different things in and out and make it come out right. I do not think we can—I honestly do not feel that we should delay in building the two that we are asking for.

Senator **Kennedy**. Well, obviously the problems, the issues have been raised about the BSY-2 combat system and certain others.

Let me ask you, just with regards to the industrial base, would we able to keep an effective submarine industrial base if we produced SSN-688s while we wait the 2 years for the SSN-21?

Admiral **Cooper**. I would like Secretary Cann to answer this.

Senator **Kennedy**. Okay.

Mr. **Cann**. On the question of building SSN-688s, you could certainly build 688s. But I think that the important point which has to—I want to go to this concurrency issue, and I am trying to answer your question and also answer the question about the BSY-2, too, because that is an important issue.

First of all, we have now got this SSN-21 under construction. And if you delayed the process for a year or two on the SSN-21, first of all, if you do have the potential for having two shipyards, which is the current plan, you need to get the other shipyard into the business, so to speak, and that is part of the purpose of the 1991 budget.

But again, and I know that people here are getting a little bit tired of hearing about this subject, but the vendor base is a major issue because if we build one and then we wait for a lengthy period of time before we start the next one, some of these vendors, who really do not have many other options, are going to get rid of the people, get rid of the tooling, get rid of the various aspects, and you will have a big start-up cost again. That is a fact of life.

Senator **Kennedy**. Okay. Could you give us, at least, if that is an option, what the impact would be on vendors, just a rough estimate? What would be the real difference if you had the SSN-688 and you let the SSN-21 slide a year? What would it be in terms of your own kinds of assessment and vendors and industrial base? Can you speak to that now, or do you want to just give us a quick note?

Admiral **Hekman**. Senator, we have done a quick-look study of what it would cost in terms of additional costs in the 688 class if we were to resume that, having now gapped it—it would be a 2-year gap. And the estimates come out between 15 and 20 percent increase in unit cost per ship.

I would expect if we were to do this in the SSN-21, because of the differences in costs of the equipment, it would be considerably higher than that. I would estimate, about 25 percent. But that is an estimate, and I would——

Senator **Kennedy**. Would you give that to us?

Admiral **Hekman**. It will take some time to run that study, but I will run the study.

[The information follows:]

Delaying follow SSN-21s by an additional 1 to 2 years would further erode an already precarious and fragile vendor/industrial base. Plant closings have recently occurred in the steel plate, pipe, cable, motor, foundry, forgings, switchboard, valve, and nuclear component industries, despite an aggressive shipbuilding and repair program by the Navy throughout the 1980s.

Procurement funds would be required to execute the current two favorably priced options for AN/BSY-2 in fiscal year 1991. Failure to execute these options in fiscal year 1991 will require renegotiation of the cost for these two units which will result in considerable cost increases. Additionally, the 2-year delay will cause a break in AN/BSY-2 production expected to increase the AN/BSY-2 fiscal years 1992 and 1993 cost $15–$20 million per unit.

The nuclear component industrial base would be particularly hard hit. In the past year, the Navy has shut down one of its nuclear fuel manufacturers, lost a second source for nuclear cores and nuclear pipe and fittings, and received notice from a number of suppliers of possible closures, due to a lack of work. If the Navy were forced to sit out altogether 1 or 2 years, many of these vendors would have to shut down since they are heavily dependent on the Navy to stay in business. Action must be taken to ensure that this uniquely qualified industrial base is supported throughout any production gap or it will not be available to support a restart of the program. The resulting increase in cost will be prohibitive and the loss of skills may be impossible to replace.

Non-nuclear component manufacturers would also be hard hit by a 1- to 2-year program delay. Many key components were bought for the lead ship with advance procurement funds due to longer fabrication spans and test cycles associated with first units. On follow ships, these components were planned to be bought in the year of ship authorization. As a result, many critical components, last bought in fiscal year 1987 and fiscal year 1988, would be subjected to a 1- to 2-year production break. These components include: motor generator sets, spherical air flasks, ventilation fans, CO_2 scrubbers, seawater valves, bow dome, etc.

The fiscal year 1991 budget is based on the plan to build one Trident per year and six SSN-21s every other year beginning in fiscal year 1993. Assuming this business base, a 1- or 2-year delay will increase total program costs approximately $2–$4 billion. Additional cost increases will be experienced on existing contract work at both Electric Boat and Newport News due to cross program impacts associated with facility/personnel loading and overhead amortization. If the Major Warship Review results in decreases in the assumed submarine building rate, significantly greater cost increases will be experienced.

Senator **Kennedy**. And also what is your own assessment—internal assessment—in terms of the industrial base, the vendors.

Admiral **Hekman**. Well, that is one of the things that has to be reviewed—I am sorry, sir.

Senator **Kennedy**. And then the additional costs that you think would be incurred in terms of the SSN-21s.

Admiral **Hekman**. One of the things that the committee should consider in the industrial base for shipbuilding is that the Navy pays 94 percent of the overhead of that entire industry. And as the unit numbers come down and those overhead costs remain, the cost per unit increases dramatically.

Senator **Kennedy**. Well, we are going to be faced with that down the road on a number of different items. I think that we are going to be stuck with that.

Mr. **Cann**. Mr. Chairman?

Senator **Kennedy**. Yes.

Mr. **Cann**. Rather than go into a great deal of detail, I would like to make one comment relative to the GAO comments on BSY-2 concurrency.

First of all, I do not agree with them at all. And I will submit for the record—I would be happy to do it now, but I would be glad to submit for the record all of the reasons why we believe that the BSY-2 is not only on schedule, but is a well organized and well thought out program to meet the ship.

And, as everyone knows, you would not build an airplane without putting an avionics suite on it. And these two programs are matched together, they are designed to go into test together. And the program and plan for the BSY-2 has been thoroughly reviewed, and it is a matter of great detail. And I would be happy to submit that for the record.

[The information follows:]

The AN/BSY-2 Submarine Combat System being developed for the *Seawolf* Class Fast Attack submarines will fully support the ships' traditional missions of seeking out and destroying enemy submarines, surface ships and land-based targets as well as nontraditional, projected missions such as laying mines, insertion of special operations forces and gathering intelligence. This advanced computer system is designed to enable the submarine to detect, track, classify and localize targets faster than existing submarine combat systems. It allows operators to perform multiple tasks and address multiple targets concurrently. Finally, it reduces the time between detecting a target and launching weapons.

Lessons learned in developing earlier combat control and acoustic systems have been incorporated into the AN/BSY-2 development effort. From the onset, a strong Navy team was put in place. It consisted of Navy laboratories, field activities, and an experienced support contractor.

Detailed development schedules are tracked using an automated tool to identify dependencies, critical path items and mitigation plans for schedule drivers. Development, integration, test and manufacturing detailed schedules from the prime and all subcontractors are integrated into this network. The network has approximately 12,000 elements. The Navy program manager holds monthly meetings with the contractor to address status of critical path drivers and mitigation plans. This process has been successful in early identification and mitigation of potential schedule issues and will continue to be a key tool in managing the development program.

The AN/BSY-2 is being developed under a Fixed Price Incentive contract. Both Design-To-Cost and Life-Cycle-Cost considerations are strongly incentivize in this contract. They play a major role in design decisions and are part of the biannual incentive evaluation process.

The fixed-price nature of the contract creates a strong incentive for both the Navy and the contractor to control development cost and maintain strict system baseline configuration control. The formal, disciplined control processes currently in place serve as excellent cost containment measures.

The risk of concurrent design of the combat system and ship has been minimized through close and regular coordination among Navy, ship design agent and combat system developer. More than 100 coordination meetings have been held at levels from engineering designer to top management. Combat system/ship interfaces have been defined in a set of agreed Interface Control Drawings (ICD). All AN/BSY-2 ship interfaces are defined and under formal configuration control.

The system has been planned and designed to include current techniques and manufacturing processes to produce the systems on time. Independent risk assessments have confirmed that there are no significant technological risks.

Production Readiness Reviews have been conducted at all development sites early in the program to identify any potential problems in the transition to production. The reviews have been successful and their early conduct allowed sufficient time to address issues without disrupting the program schedule.

The system is designed to be capable of being configured for a variety of mission types and phases. This modular partitioning facilitates incorporation of tactical improvements and reconfiguration around faults and casualties.

A 2-year System Design Definition phase conducted with two contractors prior to the start of Full Scale Development (FSD) resulted in a stable achievable functional design specification that formed a solid base for entering into the FSD phase.

Logistic considerations are an active part of the design development process to ensure that the final design can be easily maintained and supported. The contractor has developed a comprehensive Logistic Support Analysis (LSA) program to produce all logistic products. The AN/BSY-2 system is supported aboard ship by a paperless technical manual, thereby reducing space and weight considerations. The system's spare parts will be procured via the Timely Spares Provisioning program which combines spares and system procurements resulting in reduced cost.

The system development process is characterized by:

— detailed static and dynamic system performance modeling to allow early identification of bottlenecks and performance drivers

— a comprehensive and disciplined design review process (over 14,000 review comments have been resolved)

— incorporation of readiness and logistics considerations as design drivers

— strong system operability emphasis

— extensive use of metrics, templates and other risk mitigation features.

The system software development is characterized by:

— 3.2 million Source Lines of Code (SLOC), three-fourths of which are in Ada

— strong contractor hiring and training programs

— full compliance with DOD Directive 3405.2

— extensive use of CASE tools

— common software development environment: tools, standards and procedures, and style guides

— use of mature commercial Ada compiler/development system and data base management system

— large number of small Computer Software Configuration Items (CSCI); all interfaces completely specified prior to coding; able to be independently developed and tested

— strong configuration management procedures in place

— monthly development metrics reporting.

The requirements imposed by DOD-STD-2167 and the use of Ada result in more detailed design work having to be accomplished by the end of CDR than would otherwise be the case. By taking the time to fully define detailed system design requirements prior to implementation, time will be saved in the subsequent coding, system integration and test phases due to reduction in necessary rework and reuse of Ada packages within the system.

System software has been partitioned into a large number of small packages which can be independently developed, tested, and incrementally integrated. This design process is rigorous, disciplined and will benefit system integration and test.

A comprehensive testing program is in place which includes the following features:

— early development and test of identified critical items

— complete traceability of performance requirements to lowest level of design and test specifications

— extensive hardware and software unit testing prior to system integration

— incremental functional integration and test strategy

— multiple certification tests

— independent Navy test time for verification, validation and stress testing

— robust simulation/stimulation capabilities

Critical items were identified early in the program and Critical Items Test Plans were developed to ensure resolution of risk before program progress makes change costly and imposes delays.

Although there are risks inherent in the integration of technologies in any system, because of the many risk reduction measures planned into this system, all risks are manageable and assessed as being low.

The AN/BSY-2 Combat System program is structured to make maximum use of competitive market forces and fixed price contracts. The Full Scale Development (FSD) contract was awarded to GE in a competitive source selection after parallel System Design Definition efforts by GE and IBM. This FSD contract has retained IBM as a Follower to GE in a Leader/Follower program intended to provide dual sources for follow-on procurement. Although subsequent market reductions make second sourcing of combat systems uneconomical, plans are underway to provide continued competitive cost benefits by competing subsystems or high cost electronic modules in future procurement.

In addition, a competitive source selection is being conducted during 1990 for a fixed price award of the AN/BSY-2 Team Trainer development effort. It will develop and integrate trainer unique hardware and software with trainer tactical equipment.

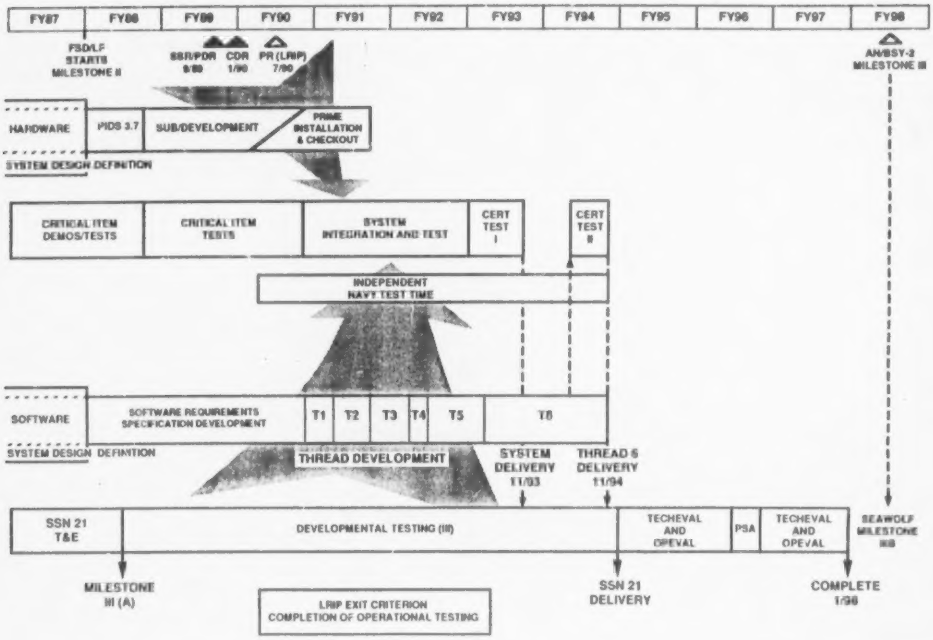
The AN/BSY-2 FSD contract includes fixed price Not-to-Exceed (NTE) contract options for Limited Production (LP) to provide for fiscal year 1989 and fiscal year 1991 shipsets and for fiscal year 1990 Maintenance Trainer and fiscal year 1991 Software Support Facility systems. The FSD contract has performance incentive fee for management, Design-to-Cost (DTC), and Leader/Follower. Contractor progress in these areas is evaluated semi-annually. Both the DTC incentive and the fixed price contract structure have combined to produce genuine incentive for the contractor design to reduce cost. This is evidenced by on-going contractor efforts to reduce the hardware required to achieve desired system performance.

Contractor cost and schedule performance is made visible by a fully compliant DOD 7000.2 Cost/Schedule Control System implemented at the prime and subcontractors. Detailed cost performance reports are submitted to the Navy and analyzed closely by the Program Office quarterly. Internal contractor data is provided to on-site government surveillance staff every 2 weeks. Individual cost account status is closely monitored by both on-site Navy and Defense Contract Management Command personnel.

The AN/BSY-2 Combat System program is receiving a high level of support from the Defense Contract Management Command who has provided increased priority and staff by designating AN/BSY-2 a "Special Program" in 1989. The Defense Contract Management Agent Office (DCMAO) Syracuse, New York, as well as DCMAO at each subcontract surveillance site provides PMO418 with a comprehensive monthly report covering cost, schedule, management and technical surveillance disciplines. This provides the program office with unique insight into status and progress at the prime and major subcontractors.

The fixed-price nature of the FSD/LP contract has created a strong incentive for both the Navy and the contractor to control development cost and maintain strict AN/BSY-2 baseline configuration control. The fixed-price incentive contract has a ceiling, at 125 percent of development cost and 115 percent of production cost, which effectively bounds government cost liability. There is a 50/50 share line for costs over target cost but under ceiling. This provides incentive to both the contractor and the Government to take responsibility for containing cost growth.

AN/BSY-2 FULL SCALE DEVELOPMENT PLAN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SSR/PDR 9/89
CDR 1/90
PR (LRIP) 7/90
AN/BSY-2 MILESTONE III
HARDWARE
PIDS 3.7
SUB/DEVELOPMENT
PRIME INSTALLATION & CHECKOUT
SYSTEM DESIGN DEFINITION
CRITICAL ITEM DEMOS/TESTS
CRITICAL ITEM TESTS
SYSTEM INTEGRATION AND TEST
CERT TEST I
CERT TEST II
INDEPENDENT NAVY TEST TIME
SOFTWARE
SOFTWARE REQUIREMENTS SPECIFICATION DEVELOPMENT
T1
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T4
T5
T6
SYSTEM DESIGN DEFINITION
THREAD DEVELOPMENT
SYSTEM DELIVERY 11/93
THREAD 6 DELIVERY 11/94
SSN 21 T&E
DEVELOPMENTAL TESTING (III)
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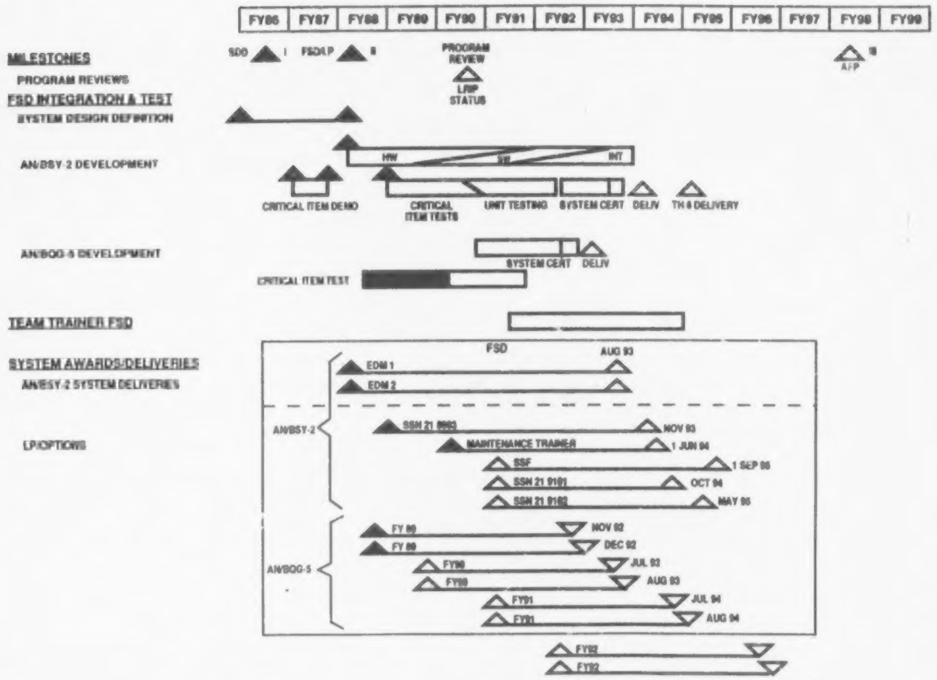
AN/BSY-2 COMBAT SYSTEM
PROGRAM PLAN



Senator Kennedy. All right.

Admiral Cooper, let me get into this other area on the limitation in terms of the total number of submarines.

You would agree that our nuclear submarines maintain an important technological edge over the Soviet counterparts?

Admiral Cooper. Yes, sir.

Senator Kennedy. And do you believe that we would be able to maintain that edge for some foreseeable future?

Admiral Cooper. I hope. Yes, sir. Of course, with the SSN-21 that is what I am banking on.

Senator Kennedy. Now, assuming that the Soviets could not successfully circumvent it, would it be to our advantage to have equal limit with the Soviets on submarines?

Admiral Cooper. I would certainly refer back to what Admiral Trost said, basically, that the limits we are looking at right now are budgetary limits. As I indicated earlier to Senator Exon, we have looked at the threat, tried to figure out how many we need. And since we are at a budgetary limit, I think it greatly reduces our flexibility.

There are also some other problems. Namely, they have diesel submarines, and they do not count SSNs—they do not count their attack submarines along with their guided missile submarines. We have one attack submarine that does both of those things, and so you have several complicating factors here. It would certainly detract from our flexibility and be a difficult thing to do.

Senator KENNEDY. Well, it would be conceivably better, if you were able to get some limit on it, for that very reason that they have a divided function. If you were able to get some total number of limits on it.

Admiral COOPER. Yes, sir. And there is also—if I may make one more point.

Our submarines do a lot more things than just look at the Soviets. The absolute requirement for the capability of the submarine, the stealth, the firepower and so on, has to be predicated to take care of that particular threat. But in fact, we do a lot of things in other parts of the area, in Third World areas, in low-intensity conflict. So there are many other things that we carry out that would call for certain numbers.

Senator KENNEDY. Well, the point I am driving at, is wouldn't the process of SSN arms control allow us to protect naval forces designed primarily for strategic and projection missions without sacrificing our current edge in terms of technology in submarine warfare?

Admiral COOPER. Well, you get into a very difficult position there, that I would want to sit and study. And the main reason is, if you say, okay, we are going to cut back in the number of attack submarines you have. And let us say that part of the problem is we are looking against their strategic submarines.

Immediately, as soon as you do that, that decreases the number of people, the number of submarines, they need now held back as we see them in their operating capabilities. We see them doing things differently, as was pointed out before by Senator McCain.

The fact is if there was not a threat, if we did not have the submarines to go out and carry out one of those missions, they, therefore, have more submarines to release, to go against our sea lines of communications.

So, there is a lot of interplay there. It is not an answer you can give just off the top of your head. It is one I would have to look at very hard.

Senator KENNEDY. Okay, I had questions on both of the fast sealift—Senator Lott referred to that, but I would like to develop it. Also, the Committee received your interim report on the Navy's plan to pursue the integrated electric drive technology. I would be interested in the technical and cost review so far and what information you were able to provide to the committee.

And then we had the Navy moving forward in the aircraft carrier technology study. We had requested that for far-reaching review on the essential information we are considering on whether or not to build additional new aircraft carriers before funding the next carrier becomes an issue in the budget.

So, I will send those over. But we are serious about all of them, and we would like to get your response on some of those.

I had a good visit at the David Taylor facility the other morning and saw some really fascinating work being done out there. It is a very impressive facility.

Mr. CANN. I am committed to the electric drive program.

Senator KENNEDY. Good. I need one in my boat. [Laughter.]

Thank you very much, gentlemen.

The Committee stands in recess.

[Questions for the record with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR EDWARD M. KENNEDY

NAVY ASSESSMENT OF CBO ANALYSIS

Senator **KENNEDY**. The CBO analysis presented earlier in this hearing presents a bleak picture of where Navy ship force levels may be headed:

a. Buying the 600 ship fleet would require 5 percent compounded real growth per year through the end of the century (funding that is probably out of the question, given declining Defense budgets);

b. If shipbuilding funds decline at the same rate as the overall budget, the fleet will be much smaller (perhaps as small as 390 ships) and its missions will have to be reconsidered; and

c. Deciding to protect one mission area at the expense of another could have much more dramatic effects on certain components of the fleet.

As I understand the analysis, the CBO also used conservative assumptions that tend to lead to a more optimistic picture. In other words, most changes in assumptions they have made would tend to make matters worse. Do you agree with the assumptions and the results of the CBO analysis as you understand them?

Admiral **NYQUIST**. We agree with the assumptions and the results of the CBO analysis. We also agree that changes in the assumptions would tend to make matters worse. CBO has described accurately the challenges we face today in procuring a strong and capable fleet.

FUTURE OPTIONS TO PROTECT FORCE LEVELS

Senator **KENNEDY**. The CBO study identifies an option for responding to the bleak picture the numbers foretell. Decisionmakers might want to selectively protect certain components of naval force capability. Are there other potential solutions that could help avoid drops in force levels, such as developing and producing somewhat less expensive ships?

Admiral **NYQUIST**. We recommend building a balanced fleet rather than selectively protecting one component at the expense of another. Forecasting the threat environment for the year 2020 is an imprecise art. A balanced, capable fleet would give us better ability to serve our Nation's interests during the uncertain years ahead.

Capability is the most important factor in determining force levels. Producing less expensive (less capable) ships could provide higher force levels, but then we would need even more ships to make up for their lack of capability. Thorough analysis has shown this approach is unaffordable.

The best way to achieve reasonable force levels is to create stability in the SCN plan. Steady state production and a balanced workload for the shipyards produces the efficiency and savings we need to keep costs down. We are also reducing life cycle costs through a concept known as flexible transition. By building fewer classes of ships, we can reduce design and start-up costs. We will build surface combatants in flights which will eliminate costly change orders and allow us to achieve economies of scale in ship construction. By building full capability into our combatants at commissioning and transitioning these ships to the less demanding protection of shipping role at mid-life, we can avoid the costly modernization programs we have experienced in the past. The savings we achieve in modernization funds should then be applied to the SCN account to offset the higher costs we pay for these more capable ships up front.

POTENTIAL SHIPBUILDING COST PROBLEMS

Senator **KENNEDY**. Mr. Cann, I understand that last week, before the Senate Appropriations Defense Subcommittee, you were asked about cost growth in Navy shipbuilding programs. What can you tell us at this time about potential cost growth beyond any reprogramming amounts reflected in the President's budget?

Mr. **CANN**. The Navy is evaluating additional potential cost growth in shipbuilding programs. We will provide the results of the evaluation as soon as it is complete.

SUBMARINE INDUSTRIAL BASE

Senator **KENNEDY**. The committee appreciates that there are substantial concerns about maintaining the country's shipbuilding industrial base. The committee added funds last year for fast sealift technology development. One implied purpose was clearly to have the Navy explore options for developing ship types that might support the domestic shipbuilding base by providing ships that would have commercial utility.

a. What is the basis for shutting off production of the SSN-688 attack submarine before the SSN-21 program has further matured?

b. Is there some "drop dead" date after which production of additional SSN-688 submarines would not be possible?

c. Could the Congress find itself with no alternative but to fund additional SSN-21 submarines, even if trouble develops, just to maintain the current shipbuilding base?

Mr. CANN. During the fiscal year 1990 budget preparations, the Navy conducted an in-depth review of the SSN-688 and SSN-21 programs. The SSN-688 was designed in the 1960s and the lead ship was delivered in 1976. Since then, additional warfighting capabilities have been incorporated and current SSN-688 submarines are faster and quieter than earlier ships. The SSN-688 Class has been steadily upgraded through the Improved 688 Program which was formally initiated in 1982. Over 25 major and 2000 minor improvements have been made to the Improved 688 Class. The improved 688s are vastly improved over the original ships. However, in achieving these improvements essentially all weight margin for future improvements has been expended. SSN-21 represents advancements in virtually all of the fundamental areas of submarine design including quieting, propulsion plants, combat systems, hull coating and propellers that are needed to assure U.S. maritime superiority in the foreseeable future. Given the declining subcontractor and supplier base we have experienced over the last several years, it was decided to end SSN-688 production in fiscal year 1990 when no SSN-21s were being built and shift to only SSN-21 production in fiscal year 1991 and out. This allows a declining vendor/shipbuilder base to focus on SSN-21.

There is no "drop dead" date after which production of additional SSN-688 submarines would be impossible. Restarting production of the SSN-688s becomes more and more costly as time passes, however. The two shipbuilders experienced problems identifying subcontractors for SSN-688 unique components even before award of the last SSN-688 shipbuilding contract in November 1989. Historically, certain major, long lead time components were placed under contract with advance procurement funds 1 and 2 years before the shipbuilding contract was awarded. There has already been a loss of subcontractors and suppliers available to support a renewed SSN-688 program. Breaks in production are disruptive and retooling would be required by many subcontractors and suppliers. It has already become costly to renew SSN-688 production. The SSN-688 Program Manager's initial estimate is that an fiscal year 1991 appropriated SSN-688 class submarine would cost 20 to 25 percent more in constant dollars per unit than the fiscal year 1990 procurement cost including 1 and 2 year advance procurement costs.

The ability to design and manufacture nuclear powered warships and their sophisticated hardware depends upon a small, highly specialized, and fragile industrial basis. For the most part, the Navy is the only customer for these components. Quantities are small. Overhead is high—the result of extensive quality organizations, and management structures required to turn out this kind of work. Companies who carry this burden rarely are able to compete successfully for less sophisticated civilian work. With the demise of the civilian nuclear industry, there is little in the way of other work to tide these firms through gaps in the shipbuilder program.

In terms of naval reactor plants to be ordered, the projection for the 1990s is about half what it has been for each of the last two decades.

In this climate, the hint that the nuclear submarine construction program might be cut back to zero or one SSN-21 per year, even if just for a short term, strikes a crippling blow. At the already very low production rate of two per year, in the fiscal year 1991 request, we cannot simply sit out a few years to see what develops—not if we expect to build nuclear powered warships in the future.

Of course, Congress should not authorize unneeded ships just to sustain an industrial base. But the *Seawolf* class is needed! The inevitable smaller force levels require us to sustain technological superiority. *Seawolf* will give us that edge.

ATTACK SUBMARINE ACQUISITION

Senator KENNEDY. There have been a number of accounts in the press recently about how the Navy intends to procure the first follow ships in the SSN-21 class. Some reports indicate that at least one of the SSN-21s in the fiscal year 1991 budget will be given sole source to Newport News Shipbuilding. Other reports have said that both ships will be awarded after open competition between the two submarine yards.

a. What is the Navy's strategy for the two SSN-21 submarines in the fiscal year 1991 budget?

b. What would the Navy's acquisition strategy be if only one SSN-21 submarine is ultimately funded in fiscal year 1991?

Mr. **Cann**. The Defense Department is currently reviewing major warship requirements. The Navy has held in abeyance any action on the fiscal year 1991 ship construction awards until the review is completed.

Senator **Kennedy**. Admiral Hekman, you made several statements about increased costs relating to any perturbation in the Navy's planned SSN-21 acquisition profile.

a. What would be the cost and programmatic effects of buying only one (1) SSN-21 in 1991?

b. What would be the cost and programmatic effects of buying two (2) SSN-688 submarine in fiscal year 1991 and delaying follow SSN-21s until fiscal year 1992?

Admiral **Hekman**. Purchasing only one (1) SSN-21 in 1991 would further erode an already precarious and fragile vendor/industrial base. Plant closings have recently occurred in the steel plate, pipe, cable, motor, foundry, forgings, switchboard, valve, and nuclear component industries, despite an aggressive shipbuilding and repair program by the Navy throughout the 1980s.

Additional cost increases will be experienced on existing contract work at both Electric Boat and Newport News due to cross program impacts associated with facility/personnel loading and overhead amortization. If the major warship review results in decreases in the assumed submarine building rate, significantly greater cost increases will be experienced.

From the standpoint of both military need and industrial base, we need the two SSN-21s in the President's budget. To sustain both force level and industrial base by substituting *Los Angeles* class submarines for *Seawolf* class is not a viable alternative. It definitely would not provide the capability we need to sustain underseas supremacy. They would be more susceptible to detection, unable to hold an edge over improving Soviet submarines, and less versatile in Third World confrontation. To stop the SSN-21 project, then build more *Los Angeles* class submarines, would drive up costs, and waste scarce resources.

MCM-1 CLASS TESTING RESULTS

Senator **Kennedy**. What is the basis of reports that the DOD Director of Operational Test and Evaluation (DOT&E) has found that the MCM-1 class ship is neither operationally effective nor operationally suitable? Please provide a copy of the applicable DOT&E report and include any comments necessary to explain the Navy's position.

Mr. **Cann**. The DOD Director of Operational Test and Evaluation (DOT&E) has not formulated a report on the operational effectiveness nor suitability of the MCM-1 class ship.

EFFECT OF MCM TESTING RESULTS ON MHC PROGRAM

Senator **Kennedy**. What effect do the conclusions in the DOT&E report have on the MHC-51 program, a ship which relies on many of the same sensors and systems?

Mr. **Cann**. The only mine countermeasures system common to the MHC-51 class and the MCM-1 class ship that was tested is the mine neutralization system (MNS). The MNS installed on MCM-1 was not representative of the production systems to be installed on the MHC-51 class. However, the system installed on MCM-1 did function satisfactorily when operated within its design parameters and therefore the production system to be installed on the MHC-51 class ships should also be satisfactory.

MHC-51 ACQUISITION STRATEGY

Senator **Kennedy**. What are the Navy's plans to provide for life cycle support for these ships? Will the Navy be purchasing configuration management and integrated logistics support packages twice, once from each shipyard?

Mr. **Cann**. The basic configuration of the ships built in each yard will be the same, however they are not required to be exact duplicates of each other nor are ships built in the same yard. Each shipbuilder will provide "as built" drawings for each ship they construct. Likewise each shipbuilder must provide integrated logistics support (ILS) documentation for any component they install that is not already in the Navy supply system. Several of the major ship systems are required to be the same throughout the class so ILS documentation will only be produced once for these systems unless the system is changed. Other components selected by the shipbuilders will also tend to be the same as it is more cost effective for the shipbuilder to use an equipment that is already logistically supported in the Navy supply system.

Senator KENNEDY. How low does the annual production rate have to fall, or how near the end of production would it be before the Navy would decide to hold a "winner-take-all" competition?

Mr. CANN. Neither shipbuilder is guaranteed follow ships, only a limited competition for follow ships. Each solicitation that is issued will be structured to include a "winner-take-all" alternative so any competition has the potential for a "winner-take-all" award. It is premature at this point to say when the Navy would select to award that way.

Senator KENNEDY. Does having major contractor furnished equipment on the MHC established as directed procurements place the shipbuilders in a disadvantageous position in negotiating with their vendors? Would having the Government purchase the equipment in one lot result in better prices?

Mr. CANN. Relatively few components (11 total) on the ship are designated sources. Given the relatively small quantity of ships per year, having the Government purchase a year's shipsets at once would probably not result in significantly lower prices. More important the shipbuilders are better suited to negotiate their particular industrial needs and manage them on a day to day basis directly with the equipment vendors rather than via the Government.

Senator KENNEDY. The Navy waited 1 year after awarding the CG-47 in fiscal year 1982 to Bath Iron Works, the second source builder, before competing additional ships in fiscal yerr 1984. Why is the Navy not following this approach in the MHC-51 program?

Mr. CANN. The acquisition strategy of the MHC-51 program from the beginning and as briefed to the various congressional committee staffs was to select a second source shipbuilder as soon as possible and compete the remaining ships between the two shipbuilders. This was planned to minimize the number of sole source contracts. We do not feel it is necessary for this ship class to delay the competition between the two shipbuilders.

FAST SEALIFT TECHNOLOGY

Senator KENNEDY. The committee was disappointed that the Department of Defense chose not to pursue the research and development effort on fast sealift alternatives. It would seem that the Navy should be interested in this program for several reasons: (1) to explore alternatives for filling the gap in being able to carry unit equipment, (2) to conduct technology studies that could have a pay off in warship or Navy auxiliary design, and (3) to provide potential "seed" technology for commercial shipbuilding in U.S. yards that could help support the shipbuilding industrial base as the Navy's business declines. Do you agree that these are valid reasons that the Navy should be interested in R&D studies related to sealift technology?

Mr. CANN. In response to the fiscal year 1990 legislation, we formed an interservice and interagency working group to guide technology and procurement planning and determine characteristics for sealift ships. A subcommittee of this working group is preparing a technology plan that would develop technology suited to the mission of naval auxiliary and amphibious ships as well as sealift ships. A key initial step in this plan is to evaluate performance parameters and determine those performance characteristics where technology can provide useful performance leverage. This initial step will establish a system engineering framework within which each aspect of strategic sealift and mobility can be assessed.

In military sealift, the important measure of effectiveness is material tonnage actually delivered to front line troops, and a key performance aspect influencing strategic mobility is reducing attrition of lift platforms, such as sealift ships. Research on reducing attrition of sealift ships against threats posed by mines and submarine launched cruise missiles and torpedoes is more important to the system engineering framework of the strategic mobility equation than marginal technology developments applied only to the sealift ships.

Furthermore, military characteristics are changing in response to a changing world. The number, configuration, and peacetime uses of sealift ships depend on the amount of land, air, and sea forces, equipment, and logistics material available to be lifted. If Army and Air Forces decline both overseas and in the United States there would be an overall net reduction of forces to be lifted. Sealift ships are also very dependent on specific scenarios envisioned regarding warning time, distance to theater, magnitude of threat, duration and intensity of conflict, and number of simultaneous conflicts to be supported. For 1988 and earlier planning assumptions, we had well in excess of required container ships and tankers and we met about 85 percent of the required unit equipment (tanks, trucks, helicopters, etc.) lift capability. We currently have more than 100 dedicated military sealift ships in our inventory that resulted from earlier planning assumptions on global, protracted, conventional superpower war scenarios.

As the world changes, scenario planning assumptions will change. These changes will affect the amount and kind of sealift that will be needed. New operational requirements or operational concepts have not been established, and we may not now need to increase government investment in sealift.

If it is determined that there is a need for additional sealift beyond current forces, the technology development plan could be implemented to pursue research that would improve the performance of future sealift forces in meeting any new requirements that may emerge.

Senator KENNEDY. What happens if there is a change in the threat facing the Navy in 10 years, but there is no shipbuilding industrial or vendor base upon which to rely to expand the fleet once again?

Mr. CANN. We fully intend to continue building naval ships for many decades into the future, and there will be a shipbuilding industrial and vendor base in 10 years. As naval budgets are constrained, the number of ships to be built is likely to be less than in the past decade, and the size of the industrial base is likely to become smaller. However, there will be a base upon which to expand should a future need arise.

If a future threat should suddenly loom without warning, the ship construction industrial base is of little immediate importance because new construction ships with long construction periods even under mobilization conditions, cannot affect the outcome of hostilities until several years after hostilities have begun. A superior national strategy for short warning scenarios is to maintain a large peacetime fleet to deter adventurism in the first place, and large enough to absorb early war attrition losses should deterrence fail.

If a future threat should gradually emerge, as happened in the 1930s leading toward protracted global conflict in the 1940s, there may well be adequate time to expand the industrial base and the fleet, as was done in the mid to late 1930s. Many of the naval and sealift ships that served in World War II were built in new shipyards that did not exist until after industrial mobilization began in the mid 1930s.

Senator KENNEDY. Would the Navy be willing to proceed with the research effort if funding were available?

Mr. CANN. As discussed in response to your first question, a technology development plan is being prepared that could be implemented if any new military sealift requirements or operational concepts emerge. A key initial step in this plan is to evaluate performance parameters, including the effects of attrition caused by opposing forces, and determine those performance characteristics where technology can provide useful performance leverage within a system engineering framework of military strategic mobility. Research and development in support of commercial shipbuilding and merchant marine are in the domain of private venture capital or the Maritime Administration.

INTEGRATED ELECTRIC DRIVE

Senator KENNEDY. Mr. Cann, the committee has received your interim report on the Navy's plan to pursue integrated electric drive technology. You said that you strongly supported the integrated electric drive concept and have placed a high priority on a technical and cost review before the program proceeds to a final acquisition milestone review. What has your technical and cost review shown thus far?

Mr. CANN. The technical and cost review is continuing. It has shown that the AOE-6 may be a more appropriate target ship than the DDG-51 for initial introduction of integrated electric drive. This is because the AOE-6 would be able to accommodate electric drive in its present machinery box, while the arrangement of machinery spaces in DDG-51 would have to be redesigned to accommodate the electric drive components. At my request, Admiral DeMars (NAVSEA 08) reviewed the current electric drive program. He sees no "fatal flaws" on technical issues. As far as cost is concerned, there is adequate RDT&E funding in the budget to support fielding in the AOE-6. This would entail an SCN cost premium on the order of $200 million for the first ship and $50 million for each of the follow ships.

Senator KENNEDY. When would you expect to be able to provide the committee with a complete report on your findings?

Mr. CANN. I expect to provide the committee with a complete report by this fall.

ADVANCED VIDEO PROCESSOR (AVP)

Senator KENNEDY. What is the current status of the Advanced Video Processor (AVP)? What problems have been encountered in its development?

Mr. CANN. The AVP is currently in full-scale engineering development. The AVP is designed with two modes of operation: The Command Interpreter (CI) mode, which emulates the performance of the combination OJ-452/OL-190 Acoustic Display Generator (ADG) currently in use in the AH/SQQ-89 system, and the Basic mode, which provides enhanced color graphics, windowing, and overlay capabilities. The AVP has completed a preliminary (CI mode Functional Performance Test (FPT) which detected several deficiencies requiring further development to resolve. In April 1990, the AVP began (CI mode Operational Suitability testing, scheduled for completion by March 1991, which has revealed additional performance deficiencies. The AVP Basic mode is still in development; Basic mode FPT is currently scheduled for September 1990 and operational suitability testing is scheduled to begin in October 1990.

Senator KENNEDY. What is required to integrate AVP into the SQQ-89 systems? How would integration of AVP into the SQQ-89 systems affect other parts of the system? What might this cost?

Mr. CANN. To integrate the AVP into the AN/SQQ-89(V)10 system without impact, the AVP, in its CI mode of operation, must functionally emulate the performance of the combination OJ-452/OL-190(ADG). However, due to the differences between the AVP raster-based and the OJ-452 stroker-based technologies, total emulation is unachievable. Moreover, the AVP performance, based on the current design, falls short of meeting Navy operational requirements, as demonstrated by operational suitability testing results to date. Both the AN/SQQ-89(V)10 sensors application software and the AVP firmware/hardware design must be changed to support integration. The cost to redesign the AN/SQQ-89 Basic to incorporate AVP is $50-$75 million and $9 million to complete AVP development.

The AN/SQQ-89I will use the AVP Basic mode. At the time the specifications for the AVP Based mode were prepared, the AN/SQQ-89I system design had yet to be developed. Since the AN/SQQ-89I contract has not been awarded, AN/SQQ-89I display requirements are not fully defined.

Senator KENNEDY. Which variant of the SQQ-89 would use the AVP? What are your current plans for installing this version of the SQQ-89 system? Have these plans changed, and if so, why?

Mr. CANN. The AN/SQQ-89(V)10 is the variant of the AN/SQQ-89 Basic system to incorporate AVP. We plan to procure AN/SQQ-89(V)(10) for installation in DDG-51 class ships beginning with fiscal year 1992 procurement. In addition, the AN/SQQ-89 Improved system will also incorporate AVP. Currently, plans for installing this version of the AN/SQQ-89 system are not available.

Senator KENNEDY. What options may exist for using derivatives of commercial display equipment in lieu of further developing the AVP? Absent congressional direction, what would be the Navy preference?

Mr. CANN. Navy experience has shown that commercial display equipment cannot be operated and reliably maintained in the shipboard environment. No current commercial display equipment nor their derivatives possess an acoustic display generator capable of satisfying AN/SQQ-89 display requirements. Absent congressional direction, the Navy would have continued using the Navy standard AN/OJ-452/OL-190 in the AN/SQQ-89 Basic, and allowed the AN/SQQ-89I full-scale development contractor(s) to select a suitable display system for their requirements.

AN/SQQ-89 SONAR SYSTEM

Senator KENNEDY. What ships are candidates for installation of the SQQ-89 and the SQQ-89 Improved sonar system?

Mr. CANN. The candidates for the SQQ-89 and SQQ-89 Improved are the FFG-7, DD-963, DDG-993, DDG-51 (all flights), and the CG-47 class ships.

Senator KENNEDY. What is planned for upgrading the sonar systems on any ships that will not receive the SQQ-89 system?

Mr. CANN. Various options are being investigated for those ships that do not receive the SQQ-89 system. These options include a stand alone configuration of the Interoperable Array Kit being developed under the SQQ-89 Improved program and the so-called SQR-18(V)3 being developed by EDO Corporation of New York.

AN/SPS-48E RADAR ON AIRCRAFT CARRIERS

Senator **Kennedy**. What purposes are served by SPS-48E on U.S. Navy aircraft carriers?

Mr. **Cann**. SPS-48E radars on aircraft carriers provide a three dimensional position input to ship command and control systems of all aircraft and other air targets within a radius of 200 miles from the aircraft carrier. This information allows the carrier to conduct air traffic control and surveillance operations.

Senator **Kennedy**. When an SPS-48E is installed what other equipment is usually provided? What are the major differences between the SPS-48E (including the related equipment) and the older SPS-48C?

Mr. **Cann**. SPS-48E radars are installed only as part of an integrated system in conjunction with the SPS-49(V)5 radar and the SYS-2 Integrated Automatic Detection and Tracking (IADT) System. The SPS-48E has not been interfaced to input to the command and control system except through the IADT system. This is the major difference between the SPS-48E and SPS-48C, a stand-alone radar system which has its own internal automatic tracking system. Other major differences between the two radars are the ease of operation and reliability improvement of the SPS-48E over the SPS-48C.

Senator **Kennedy**. Which carriers have the newer SPS-48E, and which are currently scheduled to keep the older SPS-48C?

Mr. **Cann**. Of 17 planned or in commission aircraft carriers (CV-59 to CVN-75), four have SCN funded SPS-48E radars installed or under contract (CV-63/64, CVN-74/75). Three more are planned for procurement using fiscal year 1990 OPN funds (CVN-68/69/71). Included as part of the fiscal year 1991 President's budget submission is a request for fiscal year 1991 advance procurement funding in support of the CV-67 SLEP. Included in this request is the procurement of an AN/SPS-48E. Currently, there are no plans to procure the remaining 10 carrier radars.

Senator **Kennedy**. Is it true that, after the DDG-2 and DDG-37 class destroyers are retired, the only ships equipped with the "C" version will be the aircraft carriers? What would be the cost, per carrier, to buy and install SPS-48E radars on the remaining carriers?

Mr. **Cann**. With the retirement of the DDG-2/37 ship classes, it is not true that only carriers will have the SPS-48C radar. LCC-19/20 will continue to be equipped with SPS-48Cs vice upgrading to SPS-48E. Estimates to buy and install the remaining 10 carrier SPS-48Es vary with the rate per year at which they are procured. Assuming a buyout of the program over 3 years (3/4/3-fiscal years 91/92/93), an installation cost of $5 million/48E radar, a procurement and installation cost of $10 million/ship for IADT, the unit cost is estimated at $33.2 million or $332 million total for 10 SPS-48E/IADT radar systems.

AIRCRAFT CARRIER TECHNOLOGY STUDY

Senator **Kennedy**. The committee appreciates the fact that the Navy is moving forward on the aircraft carrier technology study. This committee took the lead in seeking a far reaching review to provide essential information for consideration of whether or not to build additional new aircraft carriers before funding of the next carrier becomes an issue in the budget.

Secretary Garrett provided a detailed plan for the study effort being conducted by the Naval Studies Board from the National Academy of Sciences. I understand that, in addition to the effort being conducted by the Naval Studies Board, the Navy has engaged the Center for Naval Analysis (CNA) to perform some work on this project.

a. What will CNA be doing?

b. Is there a study plan for CNA similar to the one you have provided for the Naval Studies Board.

Mr. **Cann**. CNA has been requested to conduct a study of future aircraft carriers. The objective of this study is to define design options and tentative conceptual baselines for ship platforms from which tactical aircraft will be operated in the first half of the 21st century. The effort is to be fully coordinated with other related studies.

At this time, the study plan is still being developed by CNA.

ELECTROMAGNETIC AIRCRAFT LAUNCH SYSTEM (EMALS)

Senator **Kennedy**. What is the status of the research and development program for the electromagnetic aircraft launch system (EMALS)?

Mr. **Cann**. In October 1989, the Navy released a request for proposals for design, fabrication, installation and demonstration of Electromagnetic Aircraft Launching System (EMALS) advanced development models. Three contracts for the initial phase, preliminary design, are to be let on June 1, 1990. The contracts are for a period of 9 months. The pace of development beyond this effort will be determined by out year fiscal realities.

U.S.S. ENTERPRISE PROGRAM

Senator **Kennedy**. What is the Navy's plan for executing the U.S.S. *Enterprise* refueling/modernization? Do you still intend to split the work between Newport News Shipbuilding and the Norfolk Naval Shipyard? If not, what has caused this changed approach?

Mr. **Cann**. In light of potential reductions in force structure, the Navy is currently reviewing alternatives for the refueling overhaul of the U.S.S. *Enterprise* (CVN-65). The objective is to develop the most cost effective approach for utilization of the nuclear ship refueling industrial base, both public and private. The combined effects of early submarine retirements, the impending SSN-688 class and CVN-68 class refueling cycles, as well as reduced nuclear ship construction profiles mandate a reexamination of plans developed several years ago.

The optimum distribution of all this work must remain within budget limitations while preserving critical infrastructure and highly specialized skills in both the public and private sectors. We have made no decisions at this point.

COUNTING DEPLOYABLE AIRCRAFT CARRIERS

Senator **Kennedy**. Why is the Defense Department still counting the U.S.S. *Enterprise* as a deployable carrier, even though it will be essentially unavailable for almost 4 years?

Mr. **Cann**. Although our current definition of "deployable" excludes carriers in SLEP, *Enterprise* was not considered a SLEP and, accordingly, was defined as deployable. Our current definition of "deployable" and "non-deployable" has not changed and remains consistent with recent years' testimony and hearings on this issue. A CVN undergoing an extended refueling overhaul (RF/COH) will be involved in a complex and lengthy material upgrade. Because of this, the issue of *Enterprise* being considered "deployable" or "non-deployable" during her RF/COH is under review at this time.

ADVANCED SUBMARINE TECHNOLOGY PROGRAM

Senator **Kennedy**. What steps is the Navy taking to ensure that there is a smooth transition from DARPA to the Navy for outputs from DARPA's advanced submarine technology program?

Mr. **Cann**. The Navy and the DARPA Advanced Submarine Technology Program Office are working on the details of the plan for transition to the Navy of technologies that are under development in the DARPA Advanced Submarine Technology Program. This planning is being coordinated through the office of Advanced Submarine R&D in NAVSEA (SEA 92R). The year of transition and the specific Navy office which will receive the project have been identified but are dependent on funding levels authorized by the Congress. To ensure smooth transition of the DARPA outputs to the Navy, SEA 92R personnel actively and frequently participate in DARPA program reviews, technical evaluation of proposals, panels, and workshops. SEA 92R serves on the congressionally mandated Advanced Submarine Advisory Panel, which advises DARPA in managing the Submarine Technology Program. DARPA (Submarine Technology) serves on the NAVSEA Submarine R&D Advisory, Panel, which advises NAVSEA and OP-02 in R&D matters, and the Steering Group, which oversees the SEA 92R planning process. Some of the DARPA developed technologies are being demonstrated in proof of concept tests or through rapid prototyping on the R&D submarine and in other R&D platforms. As the concepts are refined through this process, appropriate backfit packages for existing submarines will be finalized. As a separate effort, SEA 92R is developing an SSN upgrade program that will investigate new technologies from all sources for improving the submarine force. Several of the DARPA programs are included in this program. The process is paying close attention to all developments and is assessing the impact on each class from a total ship mission effectiveness and cost benefit payoff perspective.

DEFENSE MANAGEMENT REPORT EFFECTS ON SHIP ACQUISITION

Senator **Kennedy**. What effect, if any, will the proposed Defense Management Review consolidations of acquisition activities have on the shipbuilding program, either for ships or for major government furnished equipment items?

Mr. **Cann**. The Defense Management Review (DMR) changes to the acquisition process for ships and major government furnished equipment (GFE) should not be viewed as a consolidation. It is actually a decentralization of the process. It separates the acquisition process from other aspects of new equipment, ships, planes and weapons system procurement. In so doing it reduces the number of acquisition reviews a program must undergo. The Commander, Naval Sea Systems Command, the Direct Reporting Program Manager for AEGIS and the Direct Reporting Program Manager for *Seawolf* are the three managers of the Navy's shipbuilding programs and report to the ASN(RD&A). This is the result of the Navy plan for the implementation of the DMR which includes organizational and other acquisition procedural changes that apply focused management to two major shipbuilding programs, AEGIS (DDG-51 and CG-47) and *Seawolf* (SSN-21) and several major weapons systems including Submarine Combat Systems, MK-48 and MK-50 torpedoes and the AN/SQQ-89(I) ASW Combat System.

The Program Executive Officer (PEO) and the Direct Reporting Program Manager (DRPM) will have increased responsibility and accountability with reduced oversight. The Naval Sea Systems Command will no longer exercise program decision authority for those major programs transferred to the new organization. Engineering and logistics functions within NAVSEA are being strengthened to provide continued support to these programs.

As the major programs mature and meet certain other criteria, they will be transferred to NAVSEA to provide logistics support, in-service engineering, maintenance engineering and life time management of the ships, weapons and combat systems.

SECOND SOURCING AS AN ACQUISITION STRATEGY

Senator **Kennedy**. With the prospect of declining budgets, there seems to be a movement away from using second sourcing as an acquisition strategy.

a. What criteria will the Navy use for establishing potential new second source producers?

b. What guidelines will be used to "down select" in existing dual source programs? As a general rule, would it be advisable to "down select" before technical data and design packages are available?

c. Does the Navy have current plans to "down select" in any shipbuilding or related programs?

Mr. **Cann**. The impact of the budget reductions clearly is taken into consideration when the Navy develops its acquisition strategies. We are committed to continue pursuing programs which we believe are sound candidate programs to benefit from the competitive pressures brought on by second sourcing or dual sourcing. Besides cost savings, dual sourcing also allows for better quality to be obtained as well as providing a viable arrangement for expanding our country's industrial base. Improving quality and industrial base expansion are important to us.

We do have expectations that we will be faced with programs which reflect very significant reductions in quantities to be procured. When quantities decline to the point where dual sourcing is no longer cost-effective, the Navy will adopt the cost-effective alternative. It is expected that the Navy will be reviewing its existing dual source programs as well as its new programs on a case-by-case basis to determine the appropriate acquisition approach to pursue; be it full and open competition, dual source or single source.

I expect we will most likely down select by means of a final competition between the sources in those cases where, after careful analysis, dual sourcing has been determined to be inappropriate. This is, in my opinion, the most equitable method for down selection.

Clearly, no one answer can be provided but as I earlier stated, each case needs to be analyzed on a case-by-case basis to determine the best outcome. As a general rule, I would expect it to be more beneficial to down select after technical data and design packages are available. With such data available, the two sources can compete in the fairest competitive arrangement possible.

Relative to whether the Navy has current plans to down select in any shipbuilding or ship related programs, I can state that we are reviewing a number of dual sourcing programs at this time. These studies are not yet complete. Foremost among the studies is our on-going shipbuilding study which is very extensive and which will provide analyses in the area of acquisition strategies to be employed in our future business transactions.

CHANGES IN CONTRACTOR SELECTION CRITERIA

Senator **Kennedy**. There has been discussion that the Navy would move away from competing programs solely on the basis of cost and shift evaluation criteria to other items, such as reasonableness of pricing estimates, previous contractor performance, etc. What initiatives are on the Navy's agenda in changing its evaluations of contractor offers?

Mr. **Cann**. There is considerable movement to use "best value" contracting to a greater degree. This contracting approach provides for firms to offer proposals which are evaluated on a number of criteria not just price alone. Examples of evaluation criteria normally used would be technical approach, technical capability, management, past performance and price. We are interested in obtaining the best overall deal not just the lowest price. I expect we will be employing this approach in more instances. This movement to best value is endorsed by DOD, the services and industry. It provides for smart buying.

In addition, past performance criteria is being interjected in many of our acquisitions. This effort covers our acquisitions from small purchases up to our largest weapons systems purchases.

NUCLEAR REACTOR PROGRAMS

Senator **Kennedy**. What is the most recent Environmental Impact Statement (EIS) or Supplemental EIS covering the S8G prototype nuclear propulsion plant? What is the most recent EIS or Supplemental EIS covering activities at the Kesselring Site?

Mr. **Cann**. The S8G Prototype Environmental Impact Statement (WASH-1525) was published in December 1972. Since that time, the environmental impacts associated with this plant have been inconsequential and well within the bounds of those analyzed in the 1972 EIS. Thus, there has been no need to supplement this EIS.

The S8G Prototype is the newest prototype plant built at the Kesselring Site. The S8G EIS discussed above is the most recent EIS associated with the Kesselring Site. The other three prototypes were all built or started before initial NEPA guidelines were issued by the Council, on Environmental Quality. Consequently, no EIS's were required for these prototypes. There has been no change in the use or operation of these prototypes in the intervening years which would be considered a major Federal action. A large body of current environmental information is available to the public which demonstrates that Kesselring Site operations are not adversely impacting the environment or the public. This includes the latest annual environmental monitoring report (KAPL 4709) and the Kesselring Site Environmental Summary Report (KAPL 4710), which provides an environmental history of the site.

Senator **Kennedy**. What is the technical and legal basis for concluding that installation of the Advanced Fleet Reactor (AFR) core and associated modifications in the S8G prototype would not constitute a major Federal action requiring a Supplemental EIS?

Mr. **Cann**. The basis for this conclusion is described in the attached press statement which was made after the Natural Resources Defense Council raised this issue.

[The press statement follows:]

Installation of the Advanced Fleet Reactor

The Naval Nuclear Propulsion Program operates seven prototype naval nuclear propulsion plants to test new warship propulsion plant designs before they are installed and used in ships at sea and to train Naval personnel. Subsequent to their construction, these prototype propulsion plants have been used to test new components, including improved reactor cores. This approach has been used successfully to test over 35 reactor cores of more than 20 different designs.

The S8G prototype reactor plant began operation in 1979 as the prototype for the Trident submarine. An environmental impact statement, WASH-1525, dated December 1972, was issued in accordance with the National Environmental Policy Act (NEPA). The statement concluded that operation of the prototype would have no significant impact on public health or the environment. S8G operation since that time confirms the conclusions of the environmental impact statement.

Continuing the program's 35-year practice, the Advanced Fleet Reactor (AFR) core is planned to be installed in the S8G prototype plant during its next refueling. The AFR is intended to power the Navy's new class of attack submarines, the *Seawolf* (SSN-21), scheduled to go to sea in the middle of the decade. Since 1983, this project has been the subject of congressional testimony given annually by the

Director, Naval Nuclear Propulsion. In published testimony before the House Armed Services Committee on March 4, 1983, the Director stated:

"The Advanced Fleet Reactor is the plant that will go in the new submarine. What we want to do with that is to get the core designed and built and adapted . . . so we can do our testing in an existing facility rather than have to go build a new prototype. At today's market price that would be pretty expensive."

The S8G prototype plant is the most modern naval prototype. It has containment and extensive safety features comparable to a land-based commercial plant. In addition, as with all propulsion plants designed for naval application, S8G incorporates unique features that contribute to its safety. Naval nuclear propulsion plants are built to stringent requirements to withstand battle shock and to ensure crew safety. The fuel—including that used in the AFR core—is of such high integrity it can withstand over 10 times more dynamic shock than commercial fuel and remain undamaged. The fuel is also designed to sustain rapid transients of temperature and pressure experienced during plant maneuvering. These capabilities far exceed those employed in the design of commercial reactors.

The use of naval reactors in a combat situation requires incorporation of multiple levels of safety features and the application of the concept of defense-in-depth to all aspects of design, construction, and operation. Specific design features are classified; however, there are multiple barriers for containing the release of fission products. For example, naval fuel is fabricated such that the Navy does not operate with fission products released to the primary coolant. Only limited radioactivity is found in the pure water used in the all-welded primary coolant system. Indeed, it is of highest priority that fission products be maintained in these reactor plants because the crew lives and works next to the reactor and must continue to function even if the ship sustains battle damage.

All U.S. naval reactors, including S8G, are of the pressurized water type and are designed to be stable and self-regulating. They do not need complex systems to be controlled. Protective circuitry is used for automatic reactor shutdown in case of emergency. Naval reactors are smaller and lower in power rating than typical commercial plants. A typical U.S. naval reactor has a design power rating which is much less than one tenth that of a typical commercial reactor, and normally operates at power levels well below its rating. For perspective, the combined total energy output for an entire year of all four reactors at the Kesselring Site is approximately equal to the energy produced by a typical commercial nuclear power plant operating for just 1 week. With the AFR installed, this will not change.

Although the AFR core is of slightly greater power rating than the core currently installed in the S8G plant, it is not the highest-power naval core that has been operated in a prototype. AFR incorporates the technology from over 35 years and 3700 cumulative reactor-years of safe and reliable naval reactor operation. The AFR core will be operated within all technical and safety limits designed into the S8G prototype plant.

AFR operations will result in no change to the environmental impacts as discussed in the environmental impact statement issued for the initial S8G prototype construction and verified by annual environmental monitoring reports. Practices at the Kesselring Site governing the release of radioactivity are so stringent that a typical commercial reactor operating within its license limits for a year typically releases on the order of 1000 times more radioactivity than is released in a year by the entire four-reactor Kesselring Site.

Radiation exposure to any member of the public due to Kesselring Site operations is too small to be measurable. The maximum possible radiation dose to any member of the public resulting from routine site operation can only be calculated using conservative assumptions of release and human uptake. Such a calculation shows that maximum dose is less than 0.0001 Rem per year. This is less radiation exposure than received from cosmic radiation sources during a single cross-country airplane flight, or from watching the evening programs on television for about a month due to x-rays from the television tube.

With operation of the AFR core still several years away, final action regarding NEPA documentation for the refueling has not been completed. However, since the mission and operation of the facility will remain the same and the refueling of the prototype will not alter the findings of the S8G prototype plant environmental impact statement, a new statement for this refueling is not needed.

Senator KENNEDY. In the event litigation is filed to block installation of the AFR prototype until completion of a Supplemental EIS, what are the minimum and maximum delays in the AFR test program that might be expected as a consequence of this action? In the event the AFR test program is delayed, what would be the likely impact on the commissioning of the first *Seawolf* class submarine?

Mr. CANN. We do not expect any delays associated with such litigation. We are confident that a court decision would find in favor of the Department's determination that this is not a major Federal action which could significantly impact the quality of the human environment.

The hypothetical nature of this question does not lend itself to a prescriptive response. However, DOE expects that a court would not consider a Supplemental EIS to be necessary for the refueling of an existing reactor when there will be no degradation in environmental performance; this performance has been well described in a prior EIS and verified by years of detailed environmental monitoring data.

QUESTIONS SUBMITTED BY SENATOR J. JAMES EXON

CONTRACTUAL ARRANGEMENT AND LIABILITY

Senator EXON. The BSY-2 is to be provided by General Electric to the Government, who in turn will provide the equipment to the submarine shipbuilder as Government Furnished Equipment. Wouldn't having General Electric as a subcontractor to the shipbuilder instead of prime contractor to the Government improve integration of the equipment, eliminate potential government liability for defective Government Furnished Equipment, and consolidate Navy program office oversight?

If so, should subsequent submarine shipbuilding contracts fold in the BSY-2 as a requirement of the prime contractor?

Mr. CANN. No. Consolidation of shipbuilding and combat system programs was attempted in the SUBACS program and was found not to be a satisfactory arrangement. In the case of AN/BSY-2, a combat system development organization has been formed to provide focused attention and has proven very successful.

Advantages:

Increased opportunity for competition resulting in benefits to both the Navy and the Defense Industrial Base.

Increased government control. Both BSY-2 and SSN-21 are major Acquisition Category (ACAT) I programs. To consolidate two programs of this magnitude and complexity would severely limit the Government's ability to maintain cost, schedule, and technical control over the shipbuilding contract and essentially deny the Government control over the combat system contract because of privity of contract between the shipbuilder and his subcontractor. Any risk advantages the Government could gain (e.g., defective GFM, schedule) would be diluted by the fact that the combat system would have to be a "directed" subcontract. In a directed subcontracting environment, the Government loses the advantages of control while maintaining some liability for poor subcontract performance.

Reduce the risk of delivering a poor quality end product. A shipbuilder, as a rule, does not employ personnel with the technical expertise to administer and control the production of highly sophisticated electronics and computer software that make up the AN/BSY-2 system. Using separate procurements, both the BSY-2 and SSN-21 programs can ensure themselves of personnel with relevant expertise and experience to oversee the many differing complexities of each system. The SHAPM, PMS, SUPSHIPS and GE regularly attend Interface Working Group meetings to plan and improve the integration of the equipment. The few benefits that could potentially be realized by folding AN/BSY-2 into the shipbuilding program are far outweighed by the significant risk of delivering equipment that will not meet operational and readiness requirements of the fleet.

IS THE BSY-2 BEHIND SCHEDULE OR NOT

Senator EXON. Is the BSY-2 behind schedule or not? Admiral Cooper's written testimony (page 6) states that the BSY-2 combat system is on schedule. Yet, Frank Conahan of the GAO testified in April before the House that the system is running 3 months behind schedule and two important design reviews have been delayed 5 months. Who is correct?

Mr. CANN. The BSY-2 is on schedule to meet the SSN-21 delivery requirement. It is true that design reviews were delayed to provide more detailed system analysis and design decisions. That rescheduling was accomplished so as not to have this translate into delivery delays. Experience with DOD-STD-2167/Ada applications in other system has indicated a heavy front-end effort which pays off later in faster coding and test and reduced rework. We have every confidence that BSY-2 development will meet SSN-21 requirements for installation and subsequently full operational performance at ship delivery.

CONCURRENCY OF BSY-2

Senator Exon. Is there sufficient technical risk involved with the BSY-2 to warrant significantly slowing down the SSN-21 buy so as to avoid problems such as we had with the B-1 bomber?

Mr. Cann. No. The system was designed/planned so as to include current technologies with no high risk development. The BSY-2 development program has recognized existing technical risk and has taken specific steps early in the program to mitigate this risk and prevent future rework and delay. Specific risk reduction measures taken thus far in the development of the *Seawolf's* combat system include: the application of advanced development work; a 2 year design definition contract prior to full scale development; and, a critical item design, prototyping, and test program as a part of full scale development contract. Because of the success of the work performed by the contractors in the System Design Definition Phase, and because of the success of the Critical Item Development and Test Program to date, the Navy currently assesses the technological risk as low overall. Independent risk assessment has confirmed that there are currently no significant technological risks. Although there remains risk inherent to the integration of the various technologies within the combat system, the overall producibility risks are also assessed as low. Secretary Betti's report to the Congress on the risk of concurrency of major acquisition programs assesses the performance and schedule risk of this system as low.

POTENTIAL COST OVERRUN OF BSY-2 PROGRAM

Senator Exon. What assurances can you give this committee that there will not be a considerable cost overrun in the BSY-2 program?

Mr. Cann. From the program's inception, delivering the AN/BSY-2 system on schedule at negotiated cost has been the primary objective. This philosophy is fundamental to both the acquisition strategy and management approach. The following actions have occurred to minimize potential of a cost overrun:

(1) *Specification definition.* The Government invested money in two competing contractors early in the program. This investment produced a set of well defined system specifications which have minimized cost growth in the early stages of development.

(2) *Fixed Price Contract.* The-Full Scale Development fixed price contract precisely limits the Government's liability if a cost overrun should occur. This liability is defined as a 50 percent share of the overrun up to 125 percent of the contract's target cost.

(3) *Design to cost goals.* The contract requires the contractor to meet specific design to cost goals. Their progress is monitored periodically and incentivized through semiannual performance incentive awards.

(4) *Cost/Schedule Control.* The contract requires full cost/schedule reporting which the Government monitors closely to spot adverse trends and then encourage contractor corrective action. Cost reporting is closely scrutinized through a dedicated Defense Contract Management Command Staff who routinely monitor cost data where it is generated and report findings monthly to the Program Manager.

In addition to these positive cost control initiatives, the program has recently completed a full cost estimate in parallel with an independent estimate by the Navy Center for Cost Analysis. All three estimates, which showed minimal cost growth, were reasonably close and were presented to the OSD Cost Analysis Improvement Group.

AFFORDABILITY OF THE DDG-51 DESTROYER PROGRAM

Senator Exon. According to the GAO testimony, the "DOD has determined that the original fixed-price incentive contract may no longer be appropriate for developing the DDG-51 and last fall changed the cost-sharing ratios, which significantly increased DOD's costs while eliminating Bath Iron Work's projected losses under the original contract terms."

Mr. Cann. Last fall the cost sharing ratios were changed, but the fixed price incentive structure was maintained, because of significant contract changes; primarily in ship survivability items, which entailed risks greater than those contemplated under the original contract structure. DOD's costs were increased because increased work scope was obtained. BIW was entitled to a contract adjustment for its increased costs attributable to these changes but began the work and incurred significant costs before the adjustment was finally executed last-fall.

Senator **Exon**. Gentlemen, why was this relief given when the contractor failed to live up to the pricing terms of the contract, terms which were mutually agreed to under the original contract? Why negotiate a contract which we won't stick to?

Mr. **Cann**. The contract target cost was adjusted as the result of bilaterally negotiated changes to contract requirements. The share line and ceiling were adjusted to account for a more even sharing of risk associated with ship survivability features with design and construction impacts which were unanticipated at the time of the original contract award and now added to the contract by modification. BIW and the Navy have both lived up to the terms of the contract which permits adjustments of the type executed last fall.

Senator **Exon**. What type of contract is contemplated for the fiscal year 1991 buy of 5 DDG Class ships?

Mr. **Cann**. A Fixed Price Incentive contract type is planned for the fiscal year 1991 DDG-51 Class ships.

SSN 21 REPROGRAMMING REQUEST

Senator **Exon**. The Navy is requesting a $178 million reprogramming request for the SSN-21 lead boat. According to the Navy testimony, the cost increase was due to "unexpected changes in economic factors, such as labor rate escalation and increased cost of equipment due to higher quieting standards.

Could you be more specific about breaking out the $178 million in terms of whether the increases were the responsibility of the Government? Contractor? Or poor economic projections?

Mr. **Cann**. The $178 million request is required to correct the Government underestimate for the lead ship construction budget. A portion of the reprogramming is for material underestimates resulting from the extent of increased technical requirements in silencing, depth and shock, and related vendor qualification costs reflected in the awarded shipbuilding contract price. 'The first SSN-688 orders upon which *Seawolf* cost estimates were based, were for 12 ships allowing vendors to amortize qualification costs over a much larger order than the single SSN-21 order. Further, the SSN-21 has significantly greater numbers of components requiring qualification because the SSN-21 incorporates so much new and innovative technology. Another significant cost factor contributing to the increase in SSN-21 material costs is the continuing erosion in the nuclear submarine and machinery and component vendor base over the past 20 years. Poor economic projections and declining shipyard workload also contributed to the increase, labor rates exceeded those estimated, and actual labor rate escalation at Electric Boat for fiscal year 1985 to fiscal year 1989 bidding years was more than double the OSD/OMB projections.

FUTURE GROWTH IN THE SSN-21 SUBMARINE

Senator **Exon**. The SSN-21 has, according to Navy testimony, sufficient design margin for growth to incorporate future technology advances. Additionally, the congressionally directed Initial Operating Capability Plus 10-year Mission Analysis completed by DOD early this year concluded that the *Seawolf* will be superior to the projected threat through 2005. What type of capability improvements are contemplated for the SSN-21 and, in light of the DOD finding, when would these improvements be retrofitted?

Admiral **Cooper**. The Navy is contemplating many improvements to the *Seawolf* which could be incorporated and/or backfitted into follow-on SSN-21s before the year 2005. These include improvements in sensors, weapons, shock and damage resistance, drag resistance, hull appendages and coatings, HM&E components, countermeasure launching systems, periscope systems, ESM systems, and the BSY-2 combat system.

NEW AIRCRAFT CARRIERS

Senator **Exon**. According to CBO testimony, in order to maintain a fleet of 14 deployable carriers, while retiring carriers at the end of their assumed service life of 43 years, the Navy will have to buy 5 new carriers between now and the year 2000, costing, at today's prices, $3.5 billion.

Does the Navy agree with the 45-year retirement standard? And, if so, does present Navy policy calling for 14 carriers therefore lead to the conclusion that $17.5 billion (in today's dollars) will need to be spent for replacement carriers in the next decade?

Mr. **Cann**. We use a notional aircraft carrier service life of 45 years. Carriers can serve longer than 45 years and have when necessary, because the carrier is the ultimate "modular" ship and its warfighting capability is always as current as the latest technology aircraft carried on board.

Our aircraft carrier replacement program to maintain 14 carriers would require congressional appropriations for a new carrier about once every 3 years. Congress appropriated 5 carriers in the past decade, well ahead of the pace needed to maintain 14 carriers. Through this foresight, we can slack our pace early in this decade and then return to a rate of about one carrier every 3 years beginning in mid-decade.

Two carriers will be needed in the next decade to maintain a fleet of 14 deployable carriers. These two carriers would cost about $7 billion.

Questions Submitted by Senator John Warner

SEAWOLF (SSN-21) SUBMARINE

Senator **Warner**. For the record, what are the primary reasons why the *Seawolf* (SSN-21) class of submarine is being constructed?

Admiral **Cooper**. The execution of our national military strategy (NMS), the projected threat, and the advance of technology continue to substantiate the absolute need for the *Seawolf.*

There is no question that the recent events in the Soviet Union and Eastern Europe have altered the social and political makeup of the world. These changes have served to remind us of the rapid and unpredictable nature by which political circumstances and intentions can change. Although dramatic reforms have taken place in the world, the maritime component of our NMS, which is fundamentally based on our dependence as an island nation, *has not changed.* This strategy requires us to maintain the capability to provide an early response to a broad spectrum of possible conflicts and to be able to project naval power with a sustainable, survivable, far-forward presence. The fundamental characteristics of our attack submarine force—stealth, mobility, firepower and endurance, are essential elements of the sustainable, survivable, far-forward naval presence required by our NMS.

As the world shifts from a bipolar to a multipolar system our involvement in regional crises can be expected to increase. With the continued proliferation of advanced technology weapons to Third World nations, the mission of regional crisis containment will become more difficult. Attack submarines provide invaluable options in executing the mission of conflict containment in our NMS. In a crisis, SSNs can rapidly be deployed to any ocean of the world, gather intelligence and surveillance information covertly, and remain on station unsupported in hostile waters for long periods. While on station, covertly gathering intelligence, the SSN can also provide the Battle Force Commander with significant strike capability, mining and special forces insertion capability—all while remaining completely undetected. When no longer needed, the submarine can quietly be withdrawn. If conflict escalation control fails, the far-forward covert presence of the attack submarine force can "seize the initiative" and quickly neutralize enemy forces before they leave home waters or inflict harm to U.S. and allied forces. The submarine force creates leverage out of proportion to its size because an adversary never knows whether or in what number submarines might be present.

Since the need for attack submarines to execute our NMS has not changed, the requirement for the specific type of submarine needed to implement that strategy is driven by the projected threat capability and the missions which we will execute. Although the threat of nuclear war and the invasion of Europe may have decreased, the threat from the Soviets rapidly modernizing and increasingly capable submarine force has not. Recent intelligence reaffirms that the Soviets are firmly committed to attack submarine development and production. Some projections may indicate that the Soviet attack submarine force level will decrease. This quantitative reduction in force would be solely due to the retirement of their oldest, least capable classes of submarines. Simultaneously, the Soviet's are continuing to produce markedly improved submarines assisted by the acquisition of western technology and a dedicated, well funded research and development program. Thus, the Soviet's projected force reductions, coupled with their building rate, will produce a 21st century submarine force that is significantly more capable, although slightly smaller in size.

The U.S. submarine force has maintained its historic edge in undersea superiority and absorbed a growing role in power projection capability because our force has consistently been superior in quality. We have never had equal numbers. We have achieved this qualitative superiority through the systematic modernization of our force in the three vital areas of submarine performance—weapons, sensors, and platform capability. This modernization of force capability has been centered mainly around the *Los Angeles* (SSN-688) Class of submarines. To keep pace with threat technological advances, this class has incorporated over 25 major and 2000 minor improvements in the last two decades. This has resulted in nearly a complete redesign of the interior spaces of the original submarine and a substantial improvement in its capability. In the process of installing all of these improvements, however, we have exhausted the design weight margin of the original 688. The I688 cannot physically accommodate the changes necessary to incorporate the next generation of technology to face the projected threat of the 21st century.

With strong congressional support, the *Seawolf* program was begun 8 years ago to meet the projected ASW threat and to provide a balanced power projection capability option in the execution of our NMS in the 21st century. When *Seawolf* joins the fleet in 1995, she will take to sea:

— The ultimate in 20th century stealth technology. The *Seawolf* will be the quietest submarine in the world at any speed. In fact, *Seawolf* will be over 30 times quieter than our original 688 Class of submarines.

— Double the firepower of the most advanced operational Soviet submarine. *Seawolf's* torpedo room will carry Tomahawk (sea and land-attack) missiles, Harpoon missiles, MK-48 ADCAP and CCAPS torpedoes, mines, and when developed, remotely operated vehicles.

— Highest tactical speed of any submarine in the world, providing greater search effectiveness and lower probability of counterdetection.

— Sufficient design margin for growth to incorporate future technology advances. We have utilized advanced technology design procedures to construct *Seawolf* to allow efficient modernization and maintenance to take place throughout the ship's life.

Thus, the *Seawolf* represents a truly revolutionary improvement in submarine warfighting capability and will ensure that we can execute our NMS across a wide range of possible conflict well into the 21st century.

Senator WARNER. What are the Navy's concerns regarding the industrial base if the production rate for *Seawolf* submarines is slowed to less than two per year? What are the alternative commercial opportunities for the vendors and builders who supply items used in submarine construction? In this regard, how does ship and submarine construction differ from the aircraft or electronics industries?

Mr. CANN. Because of the significant costs of business in the highly specialized nuclear submarine construction industry, at a one per year construction level, one of the shipyards would be expected to leave the submarine construction business. Additional layoffs at the remaining yard would be expected. Similar losses could be expected in the supporting vendor base leading to exceptionally high unit costs.

In the electronics and aircraft industry, there still exists an underlying commercial base of significant proportion and the quantities procured are much greater. There is no commercial shipbuilding industry in the United States.

Senator WARNER. Admiral Cooper, the GAO mentioned a potential weight problem associated with the cabinets used for the BSY-2 submarine combat system on the *Seawolf* submarine. What can you tell us about this?

Mr. CANN. The initial design layout for the SSN-21 was conducted using preliminary design specifications provided by the AN/BSY-2 program office. Following signing of the full scale development contract with General Electric in March 1988 the actual design and weight specifications were provided to Newport News in August 1989. This process resulted in a 5-ton weight change which required changes to the platform deck structure. This change has now been fully accounted for in the ship design. Considering the early stages of the design effort at the time this change was required, it is considered neither excessive nor difficult to accommodate. The Navy continues to maintain close ties between all design participants for the SSN-21 and the AN/BSY-2 through frequent meetings of the interface control working group, (approximately 70 meetings in the past 18 months).

Senator WARNER. For the record, how much has been spent to date developing and procuring the *Seawolf* submarine? Please indicate the major R&D funding lines and specify amounts by year.

Mr. CANN. The following has been expended through fiscal year 1990:

FISCAL YEAR	DEVELOPMENT (PE 0604561N) (PE 0603570N) (PE 0604567N)	SSN 21/BSY-2 PROCUREMENT (PE 0204281N)	BSY-2 DEVELOPMENT (PE 0604524N)
84	109.2	-	85.4
85	261.5	-	26.5
86	367.5	-	38.2
87	304.0	244.0	83.6
88	245.8	204.6	178.4
89	184.4	218.3	156.9
90	66.0	92.9	28.3
SUBTOTALS	1538.4	759.8	597.3
TOTAL	2895.5		

Senator WARNER. For the record, what are the primary reasons for building the *Arleigh Burke* (DDG–51) class of destroyers?

Admiral NYQUIST. Naval forces provide our national decisionmakers the essential tools for the development of their policies: flexibility of action, immediacy of resources, diversity of capability, and ambiguity of intent until a decision is made. Overseas basing is not a prerequisite for action, nor is host nation political considerations an issue.

To successfully support U.S. policy, naval forces must: (1) have the striking power to affect events ashore, (2) have local superiority over potential adversaries, (3) be sufficiently large in-numbers and capability to permit coverage of different crisis areas, (4) be able to defend against and respond to sudden attack, and (5) be able to fight a war, no matter what scale. Additionally, the forces we build today will be in the fleet for the next 30 to 40 years. Forecasting the threat environment for the year 2020 is at best an imprecise art. We can forecast, however, the broad trends of that environment and build weapon systems that are able to deal with the widest range of plausible future threats, in a balanced way.

Arleigh Burke (DDG–51) has been designed to meet the requirements of the projected operational environment over the foreseeable future. She is truly a multi-mission combatant, capable of responding across the spectrum of conflict (peacetime presence, surveillance, show of force, low intensity conflict, conventional war, theatre nuclear war, and strategic nuclear war). DDG–51 contributes directly to the mission execution of Carrier Battle Groups, Surface Action Groups, amphibious and underway replenishment forces. DDG–51 incorporates the most advanced technology available in the area of anti-air warfare (AAW). Based on the state-of-the-art phased array radar, *Arleigh Burke* provides markedly improved capability over the retiring DDG–2 and DDG–37 class ships in terms of performance, reaction time, firepower, availability and area coverage. The SPY-1D radar is designed to detect targets at long range in a clear environment and offers quantum improvements in jamming and high clutter environments. This capability will bring new clarity to the surveillance mission. The AAW weapon system provides fast response from target detection to launch of missiles from her vertical launcher, enabling rapid successful defense against sudden attack.

Arleigh Burke has the striking power necessary to affect events ashore, through the Tomahawk Weapon System and the flexibility of the Vertical Launching System (VLS). Additionally, her 5"/54 gunmount allows accurate Naval Gunfire Support (NGFS) in concert with Marine Expeditionary Forces on the beach. DDG–51s impressive Anti-Submarine Warfare (ASW) capability with the bow mounted SQS-53C sonar, SQR-19 towed array, and LAMPS MK III electronics provides long-range passive and active detection, classification, and localization for ASW and anti-surface warfare (ASUW) engagements. Harpoon in twin canister launchers completes her ability to maintain local superiority over potential adversaries.

As important as its offensive capabilities may be, the DDG–51 incorporates many of the survivability lessons learned and relearned since World War II. Survivability is enhanced through all steel construction, topside armoring, and a comprehensive collective protection system, which will allow the ship to guard against nuclear, biological and chemical agents. All vital equipment and spaces are located low in the hull, with system redundancy built in, and greatly enhanced hardening against electro-magnetic pulse and overpressure damage from blast. Acoustic, infrared and radar signatures have been reduced, making the ship more difficult to detect and target. Installed firefighting and damage control equipment are the best systems fielded in the fleet today. These features ensure that DDG-51 can continue to fight hurt, and win across the spectrum of conflict.

The President's program for *Arleigh Burke* is founded on the need to reach and maintain the required force level of 120 multi-mission surface combatants in the most cost effective manner. Careful analysis of alternative destroyer acquisition strategies has shown that a minimum of five *Aegis* ships per year is required to maintain a viable industrial base while realizing savings from a competitive two shipyard acquisition strategy.

Affordability has been a major priority since the early stages of the program. The acquisition strategy reflects vigorous competition between Bath Iron Works and Ingalls Shipbuilding Division. The affordability of this shipbuilding program ensures that the surface fleet will be sufficiently large in numbers and capability to permit coverage of different crisis areas during the unsettled future.

DDG-51 is designed to meet the national requirements of today and tomorrow. She represents the best balance between warfighting capability and affordability, and represents a ship with the versatility to respond across the spectrum of conflict. *Arleigh Burke* is built to fight and win.

ARLEIGH BURKE (DDG-51) DESTROYER

Senator **WARNER**. What are the reasons why all five destroyers requested in fiscal year 1991 should be funded? What is the unit cost and total cost for the destroyer program this year, and what would be the unit cost and total cost for the program if production for these ships were only four per year? At the lower production rate, what would happen to competition between the two construction yards?

Mr. **CANN**. Five ships per year provides the most economic production rate, fulfills force level requirements, and sustains two qualified shipyards. Reducing authorizations to four ships per year significantly eliminates the competitive benefits we have realized to date. Since each yard requires two ships per year to remain viable, the Navy could be forced to allocate ships, rather than compete them in order to maintain the vital mobilization base. This allocation of two ships to each yard will result in increased ship costs. Authorizations of less than four ships per year will result in the closure of one shipyard, damage to the vendor base, disruption and inefficiency in the *Aegis* Weapon System production base, and erosion of the combat system engineering base. Recovery will be at best difficult, costly and time consuming.

	TOTAL	UNIT COST
5 FY91 ships per year (President's budget)	$3,566M	$713M
4 FY91 ships per year	$3,242M	$810M

In the long run it is likely neither shipyard can remain financially viable with only one ship per year. A four ship authorization raises the potential of allocation (i.e., not competition) between BIW and Ingalls to ensure continued operation of both yards. With these quantities price competition would be eliminated, resulting in increased ship costs. Also to be considered is that a production rate of less than five ships per year would cause the unit prices of GFE (i.e., vertical launch system, weapons systems and hull, mechanical and electrical systems) to increase, as the economic order quantities diminishes and supplier overhead expenses are distributed against a smaller production base.

RETIREMENT OF BATTLESHIPS

Senator **WARNER**. Two battleships are scheduled to be retired during fiscal year 1991. What plans have been made preserving these ships upon decommissioning?

Admiral **NYQUIST**. Planning efforts are in progress to inactivate U.S.S. *New Jersey* and U.S.S. *Iowa* and maintain them as mobilization assets. As such, both ships will be maintained in an inactive status so they can be rapidly restored to a fully operational condition if our national interests require such action. The U.S.S. *New Jersey* will be maintained as a mobilization asset in Bremerton, Washington and the U.S.S.

Iowa will be maintained in Norfolk, thereby maintaining one inactivated battleship on each coast in case reactivation is necessary.

SHIPBUILDING

Senator **Warner**. With the decommissioning of the battleships, the Navy's ability to provide naval gunfire support to the Marine Corps will be greatly reduced. What are the Navy's plans for improving its future naval gunfire support capability?

Admiral **Nyquist**. The unofficial reports from the Naval Gun Study conducted by CNA's Dr. V. Dawson have provided some insight on what direction we should go given the present and future fiscal climate. We are pursuing the research and development of an Advanced Propellant, Smart Munition and the Electrothermal Gun which may be backfit on the existing 5"/54 Gun to provide additional range and accuracy. We intend to explore the recommendations in the Naval Gun Study.

Senator **Warner**. What is the status of the program to develop a 16-inch extended range (er) gunfire capability?

Admiral **Nyquist**. The 16-inch extended range program continues with research and development into a 16-inch to 13-inch sabot round with an IOC in [deleted].

Senator **Warner**. What plans did the Navy once have to test MLRS (the multiple launch rocket system) at sea? What would have been the objectives of the test? How much would such a test cost?

Admiral **Nyquist**. LTV Corporation proposed an at-sea feasibility demonstration of the Assault Ballistic Rocket System. This system would be an altered Army Multiple Launch Rocket System (MLRS) for a one-time firing demonstration from an LST under carefully controlled conditions to determine an at-sea application. The proposal was evaluated and despite limited sea evaluation would not address several fundamental issues that would have to be addressed in a sea based application. The cost for the at-sea demonstration would have been $14.6M. RDT&E costs would exceed $150M as the system would require the development of a new launching and fire control system in addition to marinization.

Senator **Warner**. What would be required to develop use of Vertical Launch System (VLS) canisters to provide naval gunfire support capability? What reason is there to believe that VLS tubes can be reloaded quickly during a gunfire operation?

Admiral **Nyquist**. A new development missile program would be required. If such a system were pursued, a new guidance system would have to be developed and integrated into either a current missile or a new missile due to the inherent fact that a VLS system has no aim capability. There is no technical information available to determine if VLS tubes can be reloaded quickly during a gunfire operation. Additionally the size of the missile is a major determinant in the ability to handle at sea as well as the ability to reload.

NAVAL GUNFIRE SUPPORT

Senator **Warner**. In support of Marine Corps vertical assault operations from over-the-horizon locations what weapons now in the Navy's inventory could be used to suppress enemy air defenses?

Admiral **Nyquist**. Primary defense suppression weapons are (AGM-88) and SHRIKE (AGM-45) air-launched anti-radiation missiles, delivered by A-6E Intruder and F/A-18 Hornet aircraft. Walleye I & II ER/DL (extended range - data link) and Maverick missiles provide a limited stand-off capability against a variety of targets including enemy air defense sites. Other air-delivered general purpose weapons such as MK-80 series bombs, 2.75 inch rockets, Rockeye, and APAM are also available for use against enemy defenses that can be sighted by the attacking aircraft. The Tomahawk Land Attack Missile (TLAM) and the Standoff Land Attack Missile (an imaging IR variant of Harpoon) could also be employed to attack air defense sites. The 16-inch guns of the battleships may also be used for defense suppression.

DEFENSE AGAINST TACTICAL BALLISTIC MISSILES

Senator **Warner**. What weapons now in the inventory could be used to protect a Marine Corps assault echelon against attack by tactical ballistic missiles armed with chemical warheads? What plans does the Navy have for developing new defenses against tactical ballistic missiles?

Mr. **Cann**. The Navy and Marine Corps would rely on force mobility, passive chemical defenses, interruption of command and control networks, and counter-targeting of the tactical ballistic missile launch site by aircraft, cruise-missiles, or special operations forces, if required to operate in an environment where tactical ballistic missiles presented a threat to the operating forces. The Marine Corps is currently conducting an impact assessment of the tactical ballistic missile threat to Marine Air/Ground Task Forces.

Currently, Navy missile defense systems, as well as on-going research and development efforts, are aimed at today's mature air-surface, surface-surface and cruise missile threat. These threat weapons have some characteristics which are similar to tactical ballistic missiles. The improvements to current systems, and new weapon system research and development, may be applicable to active defense against tactical ballistic missiles, as that threat matures.

LOW RATE INITIAL PRODUCTION OF NAVAL VESSELS

Senator **WARNER**. The Fiscal Year 1990 Defense Authorization Act included a provision which defines low rate initial production for major weapons systems. It also includes an exemption for naval vessel programs and for satellites. The authorization conference statement of managers specified that the term "naval vessel programs" includes the major subsystems which are inherent in the construction of those naval vessels. What can you tell us about the implementation to date of this legislation, with regard to shipbuilding programs?

Mr. **CANN**. The fiscal year 1990 Defense Authorization Act provided the Secretary of Defense latitude in defining low rate initial production for naval vessel and military satellite programs, and directed the Secretary of Defense to submit a report to Congress for each applicable naval vessel and satellite program. There is currently one applicable shipbuilding program, the SSN-21 *Seawolf*. The required report for this program is being produced to support the upcoming Defense Acquisition Board review of the SSN-21, and will be forwarded to Congress after the review is complete.

The Fiscal Year 1990 Authorization Conference Report permitted the Secretary of Defense to prescribe regulations specifically addressing initial production rate for naval vessels and directed that these regulations also cover equipments and major systems integral to the construction for naval vessels. The Deputy Secretary of Defense has approved the regulations, which were subsequently promulgated by the Under Secretary of Defense for Acquisition. The regulations require that provision be made to insure that equipment and major systems, integral to the construction of naval vessels, be produced and tested so that the ship weapon system is taken to its fleet introduction in a logical and consistent manner.

Senator **WARNER**. What would be some of the problems if an exemption were not provided for shipbuilding programs?

Mr. **CANN**. If no such exemption were provided, we would be putting both the Navy and the shipbuilder in an untenable situation. The exemption allows us to continue production at a reasonable level pending initial operational testing on the lead ship. If production of ships beyond the lead ship were delayed until completion of this testing, a delay of five or more years would be inserted at the start of a shipbuilding program. From the Navy's perspective, such a delay is untenable because it unnecessarily delays delivery of more capable ships to the fleet and ensures that the follow ships are obsolescent earlier in their service lives. From the shipbuilder's perspective, such a delay is incompatible with staying in business. New construction shipyards area specialized industrial activities with little business outside of the Navy. They cannot stand idle for long and hope to remain in business. Insertion of long delays at the start of a shipbuilding program threatens the survival of both the shipyard and its supporting vendor base. If a shipyard did elect to weather a lengthy delay between lead and follow ships and it could somehow sustain its vendor base, it would pass the costs of the idle period on to the Navy in the form of vastly increased costs for the follow ships.

Senator **WARNER**. What are the reasons why one can be comfortable with an exemption for naval vessels?

Mr. **CANN**. We can be comfortable with this exemption because the Navy, the shipbuilder, and the suppliers of naval vessel systems work together on a disciplined program of research and testing that begins long before the ship enters the construction process and continues through at-sea testing of the lead ship. This testing program is aimed at giving the highest degree of assurance that the ship will operate as advertised when it goes to sea for the first time. Ship components and systems are tested throughout their development to ensure they will do their job aboard ship. Some systems are tested at sea on other ships; others are tested at land based sites. Simulation and modeling may be used to evaluate how the individual components will perform when placed together aboard ship. When the systems are finally installed and ship construction is complete, the ship undergoes rigorous testing to confirm that it does indeed meet its technical and operational goals. This disciplined process has initial operational testing as its final and necessary step, but it allows for an honest appraisal of the technical issues throughout the development and construction process.

Senator **Warner**. As a related matter, is concurrency the same as risk, and how much concurrency is desirable in ship construction?

Mr. **Cann**. Concurrency is not the same as risk, although improper management of concurrent programs can lead to inappropriate risk. Some degree of concurrency is necessary to avoid a series of time consuming and costly gaps in a program as it evolves from development to full-scale development. The appropriate amount of concurrency to build into a shipbuilding program is a matter of judgment involving trade-offs between risk, cost, and schedule to achieve a specified level of performance. These factors must be balanced for each individual shipbuilding program; there is no universal concurrency standard that could be applied to all ship construction.

Questions Submitted by Senator William S. Cohen

Mr. **Cohen**. Which-naval vessels count toward the "600 ships"? Please list the ships by category and class, and provide figures for each of the fiscal years 1985–1991.

Mr. **Cann**. Ships of the "600-Ship Navy" are as follows:

	Ship Battle Forces						
End Fiscal Year	1985	1986	1987	1988	1989	1990	1991
Strategic Forces							
SSBN	37	39	37	37	36	34	35
AS (FBM)	4	4	4	4	4	4	4
TAK (FBM)	2	2	2	2	2	2	2
	43	45	43	43	42	40	41
Aircraft Carriers							
CV/CVN	13	13	14	14	14	14	14
Surface Combatants							
BB	2	3	3	3	4	4	2
CG	21	23	27	29	31	34	38
CGN	9	9	9	9	9	9	9
DD	31	31	31	31	31	31	31
DDG	37	37	37	37	37	26	16
FF	53	53	52	49	41	37	31
FFG	47	45	44	36	35	33	33
	200	201	203	194	188	174	160
Submarines							
SS	4	4	4	3	3	1	
SSN	96	97	98	97	96	91	86
	100	101	102	100	99	92	86
Patrol Combatants							
PHM	6	6	6	6	6	6	6
Amphibious Warfare Ships							
LCC	2	2	2	2	2	2	2
LHA	5	5	5	5	5	5	5
LHD					1	1	1
LPD	13	13	13	13	13	13	13
LPH	7	7	7	7	7	7	7
LKA	5	5	5	5	5	5	5
LSD	10	10	11	11	12	11	12
LST	18	18	18	18	18	17	17
	60	60	61	61	63	61	62

Combat Logistic Ships							
AE/TAE	13	13	13	13	13	13	13
TAF	1	1	1	1	1	1	1
AFS/TAFS	10	10	10	10	10	10	10
AO/TAO	18	18	21	23	24	22	23
AOE	4	4	4	4	4	4	5
AOR	7	7	7	7	7	7	7
	53	53	56	58	59	57	59
Mine Warfare Ships							
MCM			1	1	3	6	8
MSO	3	3	3	3	2	2	2
	3	3	4	4	5	8	10
Support Forces							
AD	9	9	9	9	9	9	9
AR	4	4	2	2	2	2	2
AS	8	8	8	8	8	8	8
ARS	6	5	8	8	8	8	8
ASR	6	6	6	6	6	6	6
ATF/TATF	7	7	7	9	9	9	9
ATS	3	3	3	3	3	3	3
AGF	2	2	2	2	2	2	2
TAGOS	6	9	10	11	16	18	20
ARL	1	1	1	1			
TAK	1	1	1	1	1	1	1
	53	55	57	60	64	66	68
Mobilization Forces Category A							
DD	1	1	1	1			
FF	6	6	7	7	8	12	18
FFG	5	9	12	15	16	18	18
LSD							1
LST	2	2	2	2	2	3	3
	14	18	22	25	26	33	40
Total Ship Battle Forces	545	555	568	565	566	551	546

Mr. COHEN. For the record, what criteria are used for including naval vessels in the "600 ships"? How was this counting system established?

Mr. CANN. The method of counting the "600-Ship Navy" was established by agreement between the Secretaries of Defense and Navy in July 1981. The memorandum of agreement states, in part, the new counting methodology "categorizes ships more in accordance with their potential contribution to the Navy's warfighting and support missions". Inclusion does not depend on the status of the ship, i.e., Active Fleet, Naval Reserve Force (NRF) or Naval Fleet Auxiliary Force (MSC NFAF), but on deployability and combat capability. A breakdown follows:

Strategic Forces

SSBNs are included for the strategic warfighting capability of the FBM submarine force as part of the U.S. strategic Triad.

Ballistic Missile Submarine—SSBN
Submarine Tenders—AS (FBM)
Support Ships—TAX (FBM)

Battle Forces

Those units which, together with their direct logistics support, form the deployable, general purpose, warfighting capability of the U.S. Navy.

Aircraft Carriers—CV, CVN
Surface Combatants
  Battleships—BB
  Cruisers—CG, CGN
  Destroyers—DD, DDG
  Frigates—FF, FFG
Submarines—SS, SSN
Patrol Combatants—PHM
Amphibious Warfare Ships—LCC, LHA, LHD, LPD, LPH, LKA, LSD, LST
Moble Logistic Ships—AE/TAE, AF/TAF, AFS/TAFS, AO/TAO, AOE, AOR
Mine Warfare Ships—MCM, *MHC, *MS0
  * Active Fleet units only

Support Forces

Units which provide indirect operational or material support.

Material Support Ships—AD, AR, AS
Fleet Support Ships—ARS, ASR, ATF/TATF, ATS
Other Auxiliaries—AGF, TAGOS, TAX, ARL, etc., as mission falls within basic support criteria

Mobilization Forces (Category A)

Units of the Naval Reserve Force whose material condition provides for a higher state of mobilization readiness than other mobilizations assets (Category B) and which are manned and maintained to remain so. These units are expected to provide the most significant warfighting "surge" capability. Currently included are:

Surface Combatants—FF, FFG
Amphibious Warfare Ships—LSD, LST

SHIP RETIREMENTS

Mr. COHEN. Which ships have been retired, or are scheduled to be retired, from service in each of the fiscal years 1985-1991?

Mr. CANN. The following ships have been retired, or are scheduled to commence inactivation and/or retirement from service in each of the fiscal years 1985-1991.

FY-85

GEORGE WASHINGTON (SSN 598)
THOMAS JEFFERSON (SSN 618)
PAPAGO (ATF 160)
PAIUTE (ATF 159)
QUAPAW (ATF 110)
MOCTOBI (ATF 105)
AEOLUS (TARC 3)

FY-86

MONTICELLO (LSD 35)
SKATE (SSN 578)
PRESERVER (ARS 8)
CONSERVER (ARS 39)

FY-87

AJAX (AR 6)
NORTON SOUND (AVM 1)
NATHAN HALE (SSBN 623)
NATHANAEL GREENE (SSBN 636)
HECTOR (AR 7)
SEAWOLF (SSN 575)
SNOOK (SSN 592)

FY-88

TALBOT (FFG 4)
MCDONNELL (FF 1043)
BROOKE (FFG 1)
SCHOFIELD (FFG 3)
BONEFISH (SS 582)
SARGO (SSN 583)
PAGE (FFG 5)
BRADLEY (FF 1041)
RAMSEY (FFG 2)
SAMPLE (FF 1048)
SCAMP (SSN 588)
TULLIBEE (SSN 597)

FY-89

FURER (FFG 6)
BRUMBY (FF 1044)
VOGE (FF 1047)
O'CALLAHAN (FF 1051)
FIDELITY (MSO 443)
SWORDFISH (SSN 579)
GLENARD P. LIPSCOMB (SSN 685)
A. JACKSON (SSBN 619)
JAMES MONROE (SSBN 622)
EDSON (DD 946)
GARCIA (FF 1040)
KOELSCH (FF 1049)
DAVIDSON (FF 1045)
A. DAVID (FF 1050)
SPHINX (ARL 24)
POLLACK (SSN 603)
DACE (SSN 607)
JOHN ADAMS (SSBN 620)
HENRY CLAY (SSBN 625)

FY-90

CORAL SEA (CV 43)
CALOOSAHATCHEE (AO 98)
SPIEGEL GROVE (LSD 32)
DARTER (SS 576)
SKIPJACK (SSN 585)
SHARK (SSN 591)
BARB (SSN 596)
JACK (SSN 605)
GLENARD P. LIPSCOMB (SSN 685)
DANIEL WEBSTER (SSBN 626)
HENRY B. WILSON (DDG 7)
CHARLES F. ADAMS (DDG 2)
LAWRENCE (DDG 4)
RICHARD E. BYRD (DDG 23)
CLAUDE V. RICKETTS (DDG 5)
JOSEPH STRAUSS (DDG 16)
*INFLICT (MSO 456)
WACCAMAW (TAO 109)
CANISTEO (AO 99)
ALAMO (LSD 33)
HERMITAGE (LSD 34)
BARBEL (SS 580)
SCULPIN (SSN 590)
PLUNGER (SSN 595)
HADDO (SSN 604)
JAMES MONROE(SSBN 622)
HENRY CLAY (SSBN 625)
SELLERS (DDG 11)
JOHN KING (DDG 3)
FARRAGUT (DDG 37)
COONTZ (DDG 40)
DEWEY (DDG 45)
*ILLUSIVE (MSO 448)
*MIZAR (TAGOR 11)
MISPILLION (TAO 105)
*DUTTON (TAGS 22)

FY-91

IOWA (BB 61)
BARNEY (DDG 6)
SAMPSON (DDG 10)
CONYNGHAM (DDG 17)
TATTNALL (DDG 19)
LUCE (DDG 38)
WILLIAM V. PRATT (DDG 44)
PERMIT (SSN 594)
GUARDFISH (SSN 612)
GREENLING (SSN 614)
QUEENFISH (SSN 651)
PASSUMPSIC (TAO 107)
PLUCK (MSO 464)
NEW JERSEY (BB 62)
TOWERS (DDG 9)
HOEL (DDG 13)
SEMMES (DDG 18)
COCHRANE (DDG 21)
KING (DDG 41)
BLUEBACK (SS 581)
TINOSA (SSN 606)
FLASHER (SSN 613)
HADDOCK (SSN 621)
SEA DEVIL (SSN 664)
*FEARLESS (MSO 442)

* Not included in overall count of ship battle forces. This unit falls within the category of "Local Defense and Miscellaneous Support Forces".

Senator Cohen. What factors should be considered when evaluating proposals to accelerate retirement of ships?

Admiral Nyquist. The factors to be considered include:

— The impact on the overall composition and force levels of surface combatants available for deployment.

— The effect on Personnel Tempo (PERSTEMPO) and Operations Tempo (OPTEMPO) when force levels are reduced.

— The ability of Fleet Commanders to handle long range, scheduled commitments and short notice, contingency operations with a lesser number of available ships.

— The material condition of the ships to be accelerated.

— The current and projected rates of delivery of replacement combatants.

— The changes in global or theater operational commitments and expected response time to crisis situations.

— The current or projected fiscal constraints.
— Age and warfighting capability of candidate ships.

Mr. COHEN. Which ships which have been delivered, or are scheduled to be delivered, to the Navy in each of the fiscal years 1985–1991?

Mr. CANN. Ships delivered and scheduled to be delivered, by fiscal year 1985–1991, are as follows. An asterisk indicates ships redelivered from an inactive status.

FY 1985

VINCENNES (CG 49)
VANDERGRIFT (FFG 48)
TAYLOR (FFG 50)
GARY (FFG 51)
CARR (FFG 52)
HAWES (FFG 53)
FORD (FFG 54)
ELROD (FFG 55)
SIMPSON (FFG 56)
WHIDBEY ISLAND (LSD 41)

ALABAMA (SSBN 731)
AUGUSTA (SSN 710)
OLYMPIA (SSN 717)
HONOLULU (SSN 718)
PROVIDENCE (SSN 719)
* SPHINX (ARL 24)
SAFEGUARD (ARS 50)
VINDICATOR (TAGOS 3)
TRIUMPH (TAGOS 4)
ASSURANCE (TAGOS 5)
PERSISTENT (TAGOS 6)

FY 1986

* MISSOURI (BB 51)
VALLEY FORGE (CG 50)
BUNKER HILL (CG 52)
REUBEN JAMES (FFG 57)
SAMUEL B. ROBERTS (FFG 58)
GERMANTOWN (LSD 40)
ALASKA (SSBN 732)
NEVADA (SSBN 733)

PITTSBURGH (SSN 720)
CHICAGO (SSN 721)
GRASP (ARS 51)
SALVOR (ARS 52)
INDOMITABLE (TAGOS 7)
PREVAIL (TAGOS 8)
ASSERTIVE (TAGOS 9)

FY 1987

THEODORE ROOSEVELT (CVN 71)
THOMAS GATES (CG 51)
MOBILE BAY (CG 53)
ANTIETAM (CG 54)
LEYTE GULF (CG 55)
KAUFFMAN (FFG 59)
RODNEY M. DAVIS (FFG 60)
FORT MCHENRY (LSD 43)
AVENGER (MCM 1)
KEY WEST (SSN 722)

LOUISVILLE (SSN 724)
HELENA (SSN 725)
* PRESERVER (ARS 8)
* CONSERVER (ARS 39)
GRAPPLE (ARS 53)
INVINCIBLE (TAGOS 10)
HENRY J. KAISER (TAO 187)
JOSHUA HUMPHREYS (TAO 188)
JOHN LENTHALL (TAO 189)

FY 1988

SAN JACINTO (CG 56)
LAKE CHAMPLAIN (CG 57)
OKLAHOMA CITY (SSN 723)
SAN JUAN (SSN 751)
* PAIUTE (ATF 159)

* PAPAGO (ATF 160)
ADVENTUROUS (TAGOS 13)
ANDREW J. HIGGINS (TAO 190)
WALTER S. DIEHL (TAO 193)

FY 1989

* WISCONSIN (BB 64)
PHILIPPINE SEA (CG 58)
PRINCETON (CG 59)
CHANCELLORSVILLE (CG 62)
INGRAHAM (FFG 61)
WASP (LHD 1)
GUNSTON HALL (LSD 44)
DEFENDER (MCM 2)
SENTRY (MCM 3)
TENNESSEE (SSBN 734)
PENNSYLVANIA (SSBN 735)
NEWPORT NEWS (SSN 750)
PASADENA (SSN 752)
TOPEKA (SSN 754)
AUDACIOUS (TAGOS 11)
WORTHY (TAGOS 14)
TITAN (TAGOS 15)
CAPABLE (TAGOS 16)
TENACIOUS (TAGOS 17)
LEROY GRUMMAN (TAO 195)

FY 1990

ABRAHAM LINCOLN (CVN 72)
NORMANDY (CG 60)
MONTEREY (CG 61)
COWPENS (CG 63)
COMSTOCK (LSD 45)
TORTUGA (LSD 46)
CHAMPION (MCM 4)
GUARDIAN (MCM 5)
DEVASTATOR (MCM 6)
WEST VIRGINIA (SSBN 736)
ALBANY (SSN 753)
MIAMI (SSN 755)
BOLD (TAGOS 12)
RELENTLESS (TAGOS 18)
JOHN ERICSSON (TAO 194)
PECOS (TAO 197)

FY 1991

COWPENS (CG 63)
GETTYSBURG (CG 64)
CHOSIN (CG 65)
HUE CITY (CG 66)
ARLEIGH BURKE (DDG 51)
RUSHMORE (LSD 47)
ASHLAND (LSD 48)
PATRIOT (MCM 7)
SCOUT (MCM 8)
KENTUCKY (SSBN 737)
SCRANTON (SSN 756)
ALEXANDRIA (SSN 757)
ASHEVILLE (SSN 758)
SUPPLY (AOE 6)
VICTORIOUS (TAGOS 19)
ABLE (TAGOS 20)
BENJAMIN ISHERWOOD (TAO 191)
KANAWHA (TAO 196)

Mr. COHEN. How many cruisers, destroyers and frigates were in the Navy during each of the fiscal years 1970–1990?

Mr. CANN. The number of cruisers, destroyers and frigates in the Navy at the end of each fiscal year 1970–1990 is as follows:

End FY	70	71	72	73	74	75	76	77	78	79	80
	Battle Forces										
CA	2	1	1	1	1						
CG	22	23	24	25	23	22	21	20	20	20	18
CGN	3	3	3	3	4	5	5	7	8	8	8
	27	27	28	29	28	27	26	27	28	28	26
DD	122	103	93	71	32	32	31	25	30	36	43
DDG	37	38	38	37	37	38	38	39	37	37	37
	159	141	131	108	69	70	69	64	67	73	80
FF	36	47	57	58	58	58	58	58	58	58	59
FFR	5	4	3	3							
FFG	6	6	6	6	6	6	6	6	7	7	12
	47	57	66	67	64	64	64	64	65	65	71
	Mobilization Forces Category A										
DD								1	1	1	1
FF	5	4	4	4							
	5	4	4	4				1	1	1	1
	Mobilization Forces Category B										
DD	28	28	31	31	37	32	30	29	27	23	15

End FY	81	82	83	84	85	86	87	88	89	90
	Battle Forces									
CG	18	18	19	20	21	23	27	29	31	34
CGN	9	9	9	9	9	9	9	9	9	9
	27	27	28	29	30	32	36	38	40	43
DD	43	43	31	31	31	31	31	31	31	31
DDG	39	41	37	37	37	37	37	37	37	26
	82	84	68	68	68	68	68	68	68	57
FF	59	55	53	53	53	53	52	49	41	37
FFG	19	27	36	41	47	45	44	36	35	33
	78	82	89	94	100	98	96	85	76	70
	Mobilization Forces Category A									
DD	1	1	1	1	1	1	1	1		
FF		4	6	6	6	6	7	7	8	12
FFG				3	5	9	12	15	16	18
	1	5	7	10	12	16	20	23	24	30
	Mobilization Forces Category B									
DD	8	4	2							

AIRCRAFT CARRIERS

Senator Cohen. For each of the fiscal years 1970–1990, list the numbers of (1) aircraft carriers (total), (2) "deployable" aircraft carriers, (3) airwings (total), (4) active airwings, and (4) reserve airwings.

Mr. CANN. The information follows:

	# CV's	# Depl CV	Total CVWs	CVWs	RCVWs
1970	19	19	21	19	2
	(incl 4 CVS)*		(incl 4 CVSG)**		
1971	18	18	20	18	2
	(incl 3 CVS)*		(incl 4 CVSG)**		
1972	17	17	20	18	2
	(incl 3 CVS)*		(incl 4 CVSG)**		
1973	16	16	19	17	2
	(incl 2 CVS)*		(incl 3 CVSG)**		
1974	14	14	16	14	2
1975	15	15	16	14	2
1976	13	13	15	13	2
1977	13	13	15	13	2
1978	13	13	14	12	2
1979	13	13	14	12	2
1980	13	13	14	12	2
1981	13	12	14	12	2
1982	13	12	14	12	2
1983	14	13	14	12	2
1984	14	13	15	13	2
1985	14	13	15	13	2
1986	14	13	15	13	2
1987	15	14	16	14	2
1988	15	14	15	13	2
1989	15	14	15	13	2
1990	15	14	15	13	2

- SLEP CV not deployable
* CVS - Anti-Submarine Warfare Aircraft Carrier
** CVSG - CVS Reserve Air Group

"DEPLOYABLE" AIRCRAFT CARRIER DEFINED

Senator COHEN. What is the definition of a "deployable" aircraft carrier? When the U.S.S. *Enterprise* commences her refueling overhaul, will this ship be "deployable" or "non-deployable"?

Mr. CANN. Our current definition has not changed and is consistent with recent years' testimony and hearings on this issue. Simply stated, a deployable aircraft carrier is one able to be employed reasonably quickly, when required, to meet scheduled commitments or emergent contingency situations. A CV undergoing the Service Life Extension Program (SLEP) is categorized as a non-deployable carrier due to the length of out-of-service time and the complexity of the material upgrade (2½ years vice a normal 9-12 month overhaul). Once a CV SLEP is commenced, the ship cannot reasonably be returned to service quickly. We have, therefore, excluded these carriers from the "deployable" category.

The issue of *Enterprise* being considered "deployable" or "non-deployable" during her refueling overhaul is under review at this time.

SHIP CONSTRUCTION

Senator COHEN. In general, which is more important to the Navy, funding the construction of new ships or paying to operate older ships? What factors does the Navy consider when allocating budget resources for these purposes?

Admiral NYQUIST. The answers to these questions are heavily influenced by how near term the threat or potential world crisis is evaluated to be. The Navy is a highly capital intensive organization requiring a great deal of long term planning. Any ship procurement or replacement becomes a 10- to 14-year investment. An average of 7 years goes into the concept, design and planning and 5 to 7 years is required to build the ship. Therefore, we plan the building of ships around a Navy force level which is based on our best estimate of the future. On the other hand, if a crisis develops we may have to put priority on the operating funds of the ships we already have. That "balancing act" set of decisions is very carefully reviewed every year. We can't face a crisis with ships we haven't built, but we can't fight a modern enemy of the future without building modern ships and weapons now.

Some of the primary factors that go into this yearly decision making are:

1. A careful and conservative review of the future threats and the immediacy of requirements.
2. A careful review of the force structure that might be required to meet the threat or discourage its generation.
3. Once the force structure is decided, the acquisition of those ships is determined by a simple mathematical relationship between the expected service lives of those ships and the number that are built each year. An example follows:

Force requirement = Number of ships built per year X Service Life, (i.e. If a force structure of 100 Attack Submarines that have a service life of 30 years is decided to be the requirement, then we must build an average 3.3 submarines per year.)

TIME REQUIRED TO BUILD A SHIP

Senator COHEN. What are the notional leadtimes required for building ships of various classes? What "benchmarks" are typically used for measuring these time periods? What were the actual time periods required for some of the major ships recently built?

Mr. CANN. The typical benchmarks used to measure the time required to build a ship are shipbuilding contract award date and delivery date. Notional times often used for various ship types are:

CVN	84 months
SSBN	80
SSN	72
LHD	66
CG/DDG	60
TAO	40

Recent actual experience for various ships has been:

CVN 72	82 months
SSBN 734	83
SSBN 735	81
SSN 752	74
SSN 754	70
LHD 1	62
CG 58	61
CG 59	59
CG 60	60
CG 62	57
TAO 193	40
TAO 195	42

Senator COHEN. Compare U.S. and Soviet ship construction, by type and tonnage and year, for the years 1981-1990. An unclassified answer is preferred.

Mr. CANN. Ships delivered to the U.S. Navy each fiscal year 1981-1990 including full load tonnage are as follows:

TYPE	NUMBER	TONNAGE
	1981	
SSN	5	34,635
TOTAL SUB	5	34,635
DDG	3	28,720
FFG	6	21,510
TOTAL SURFACE	9	50,230
AD	1	20,740
AO	2	52,220
AS	1	2,040
ATF	3	6,000
TOTAL OTHER	7	81,000
1981 OVERALL TOTAL	21	165,865

1982

SSBN	2	37,400
SSN	5	34,635
TOTAL SUB	7	72,035
CVN	1	91,487
DDG	1	9,570
FFG	8	28,680
TOTAL SURFACE	10	129,737
AD	1	20,740
AO	2	52,220
PHM	5	1,210
TOTAL OTHER	8	74,170
1982 OVERALL TOTAL	25	275,942

1983

SSBN	1	18,700
SSN	4	27,708
TOTAL SUB	5	46,408
DD	1	8,650
FFG	10	35,850
TOTAL SURFACE	11	44,500
AD	1	20,740
AO	1	26,110
TOTAL OTHER	2	46,850
1983 OVERALL TOTAL	18	137,758

1984

SSBN	2	37,400
SSN	4	27,708
TOTAL SUB	6	65,108
CG	2	19,280
FFG	7	25,095
TOTAL SURFACE	9	44,375
AGOS	2	4,638
ARC	1	15,700
TOTAL OTHER	3	20,338
1984 OVERALL TOTAL	18	129,821

1985

SSBN	1	18,700
SSN	4	27,708
TOTAL SUB	5	46,408
CG	1	9,620
FFG	8	28,680
TOTAL SURFACE	9	38,300
AGOS	4	9,276
ARS	1	3,086
LSD	1	15,165
TOTAL OTHER	6	27,527
1985 OVERALL TOTAL	20	112,235

1986

SSBN	2	37,400
SSN	2	13,854
TOTAL SUB	4	51,254
CG	2	19,000
FFG	2	7,170
TOTAL SURFACE	4	26,170
AGOS	3	6,957
ARS	2	6,172
LSD	1	15,165
TOTAL OTHER	6	28,294
1986 OVERALL TOTAL	14	105,718

1987

SSN	3	20,781
TOTAL SUB	3	20,781
CG	4	38,000
CVN	1	91,487
FFG	2	7,170
TOTAL SURFACE	7	136,657
AGOS	1	2,319
AO	3	142,146
ARS	1	3,086
LSD	1	15,165
MCM	1	1,260
TOTAL OTHER	7	163,976
1987 OVERALL TOTAL	17	321,414

1988

SSN	2	13,854
TOTAL SUB	2	13,854
CG	2	19,000
TOTAL SURFACE	2	19,000
AGOS	1	2,319
AO	2	94,764
TOTAL OTHER	3	97,083
1988 OVERALL TOTAL	7	129,937

1989

SSBN	2	37,400
SSN	3	20,781
TOTAL SUB	5	58,181
CG	3	28,500
FFG	1	3,993
TOTAL SURFACE	4	32,493
AGOS	5	11,595
AGS	1	15,801
AO	1	47,382
LHD	1	40,863
LSD	1	15,165
MCM	2	2,557
TOTAL OTHER	11	133,363
1989 OVERALL TOTAL	20	224,037

	1990	
SSBN	1	18,700
SSN	2	13,854
TOTAL SUB	3	32,554
CG	2	19,083
CVN	1	91,487
TOTAL SURFACE	3	110,570
AGOS	2	4,638
AGS	1	15,821
AO	1	47,382
LSD	2	31,154
MCM	3	3,819
TOTAL OTHER	9	102,814
1990 OVERALL TOTAL	15	245,938

Senator COHEN. Compare U.S. and Soviet ship construction, by type and tonnage and year, for the years 1981-1990. An unclassified answer is preferred.

Mr. CANN. Answer:

1981

TYPE	NUMBER	TONNAGE
SS	3	7,350
SSN	4	17,600
SSGN	0	0
SSBN	1	10,600
SSAN	0	0
TOTAL SUB	8	35,550
CVG	0	0
CVHG	0	0
CGN	1	37,000
CG	0	0
DDG	1	7,850
FF(G)	3	6,800
FFL	3	3,300
TOTAL SURFACE	8	54,950
1981 OVERALL TOTAL	16	90,550

1982

TYPE	NUMBER	TONNAGE
SS	4	10,450
SSN	3	14,700
SSGN	1	11,500
SSBN	2	29,100
SSAN	1	1,600
TOTAL SUBS	11	67,350
CVG	0	0
CVHG	1	37,100
CGN	0	0
CG	1	12,500
DDG	3	23,650
FF(G)	2	5,200
FFL	4	4,400
TOTAL SURFACE	11	82,850
1982 OVERALL TOTAL	22	150,200

1983

TYPE	NUMBER	TONNAGE
SS	3	6,550
SSN	4	20,200
SSGN	0	0
SSBN	1	18,500
SSAN	0	0
TOTAL SUB	8	45,250
CVG	0	0
CVHG	0	0
CGN	0	0
CG	1	12,500
DDG	4	28,400
FF(G)	1	1,600
FFL	3	3,300
TOTAL SURFACE	9	45,350
1983 OVERALL TOTAL	17	90,600

1984

TYPE	NUMBER	TONNAGE
SS	3	6,900
SSN	3	15,800
SSGN	0	0
SSBN	1	10,800
SSAN	0	0
TOTAL SUB	7	33,500
CVG	0	0
CVHG	0	0
CGN	0	0
DDG	2	15,750
FF(G)	2	5,200
FFL	5	5,550
TOTAL SURFACE	9	26,450
1984 OVERALL TOTAL	16	59,950

1985

TYPE	NUMBER	TONNAGE
SS	4	9,200
SSN	1	4,900
SSGN	1	13,000
SSBN	2	29,300
SSAN	0	0
TOTAL SUB	8	56,400
CVG	1	65,000
CVHG	0	0
CGN	0	0
CG	0	0
DDG	3	15,750
FF(G)	2	5,200
FFL	2	2,200
TOTAL	8	88,150
1985 OVERALL TOTAL	16	144,550

1986

TYPE	NUMBER	TONNAGE
SS	4	9,200
SSN	2	13,500
SSGN	1	13,000
SSBN	2	29,300
SSAN	0	0
TOTAL SUB	9	65,000
CVG	0	0
CVHG	0	0
CGN	1	37,000
CG	0	0
DDG	2	12,800
FF(G)	1	1,900
FFL	2	2,200
TOTAL SURFACE	6	53,900
1986 OVERALL TOTAL	15	118,900

1987

TYPE	NUMBER	TONNAGE
SS	4	9,200
SSN	2	12,400
SSGN	1	13,000
SSBN	1	10,800
SSAN	0	0
TOTAL SUB	8	45,400
CVG	0	0
CVHG	0	0
CGN	0	0
CG	0	0
DDG	4	31,450
FF(G)	2	5,500
FFL	5	5,500
TOTAL SURFACE	11	42,450
1987 OVERALL TOTAL	19	87,850

1988

TYPE	NUMBER	TONNAGE
SS	4	9,200
SSN	2	12,400
SSGN	1	13,000
SSBN	1	10,800
SSAN	1	1,600
TOTAL SUB	9	47,000
CVG	1	65,000
CVHG	0	0
CGN	0	0
CG	0	0
DDG	2	15,750
FF(G)	2	8,170
FFL	3	3,300
TOTAL SURFACE	8	92,220
1988 OVERALL TOTAL	17	139,220

1989

TYPE	NUMBER	TONNAGE
SS	4	9,200
SSN	3	18,400
SSGN	0	0
SSBN	2	29,300
SSAN	0	0
TOTAL SUB	9	56,900
CVG	0	0
CGN	1	37,000
CG	0	0
DDG	2	15,700
FF(G)	1	3,600
FFL	5	5,500
TOTAL SURFACE	9	61,800
1989 OVERALL TOTAL	18	118,700

1990 (PROJECTED)

[Deleted.]

1. All data for years 1981-89 are unclassified.
2. The projected 1990 data is SECRET.
3. Data included here refers to launches.
4. Units listed here are combatants only. No auxiliaries, amphibious ships, or minesweepers.
5. Tonnage here is given as full load displacement for surface ships, surface displacement for submarines.
6. U.S. estimates on TBILISI displacement are used here.
7. FFLs here refer to GRISHAs. FF(G)s are KONIs, KRIVAKs, and BALCOM-8s.

NAVAL RESERVE

Senator COHEN. For FFG 7 and FF 1052 class frigates assigned to Active forces and to the Reserve, (1) what are the average annual operating costs, (2) how many Active personnel are assigned, and (3) how many Reserve personnel are assigned?

Admiral NYQUIST. Average annual operating costs for fiscal year 1989 were:

	ACTIVE	RESERVE
*FF 1052	$19.4M	$15.9M**
*FFG 7	$13.6M	$11.8M**

The following manning breakdown applies for Naval Reserve Force Frigates:

ENLISTED -	USN	TAR	ACTIVE	SELRES	TOTAL
FF 1052	101	77	(178)	125	303
FFG 7	67	66	(133)	69	201
OFFICER					
FF 1052	8	4	(12)	7	19
FFG 7	8	5	(13)	3	16

The following manning breakdown applies for active frigates:

ENLISTED -	TOTAL ACTIVE
FF 1052	270
FFG 7	196
OFFICER	TOTAL ACTIVE
FF 1052	19
FFG 7	15

*Note that operating costs are priced at average MPN/RPN rates. However, given a force structure reduction, end strength would generally be reduced by deleting accessions. Accordingly, savings for such adjustments are less than operating costs, since these would be based on the lower accession rate.

**Does not account for SIMA support personnel.

Senator COHEN. What is the basis for assigning a particular number of Active duty personnel to a Reserve frigate? (2) Also, are TAR personnel assigned to intermediate maintenance activities in support of Reserve frigates, and if so how many? (3) What is their cost?

Admiral NYQUIST. (1) Minimum Active-duty (full time) manning requirements are driven by several factors in addition to operating tempo: (a) The minimum required to maintain a ship in a safe to steam condition, (b) the minimum required number of qualified personnel to stand both inport and underway watches, (c) the level of operational readiness acceptable, (d) certification requirements based on trained operators for both engineering and combat systems, (e) maintaining sufficient personnel to ensure physical security of the ship, and (f) the ability to combat fire, flooding, hull damage, and other serious casualties.

The following number of TAR personnel are assigned to intermediate maintenance activities in support of Reserve frigates, at the listed costs for fiscal year 1990:

	NUMBER	COSTS
OFFICERS	24	$1.7M
ENLISTED	1075	32.3M

Senator COHEN. What factors are important when considering whether to place ships in the Reserve? A detailed response which includes considerations for particular ship types is desired.

Admiral NYQUIST. The factors considered when deciding whether or not to place ships in the Reserve are the same as those which affect overall force decisions: (a) the ship is not required as a forward-deployed unit, but its overall material and training readiness can be maintained by a combination Active/Reserve crew at a level which makes it a viable mobilization asset in the event of national emergency, (b) the Naval Reserve can support the ship with manpower within existing demographics, (c) there must be an appreciable savings resulting from the transfer, and (d) the ships remaining in active service must be adequate to meet the Navy's peacetime requirements, including crisis/contingency response.

Using the above criteria, key battle force combatants are not the appropriate platforms to place in the Reserve. Frigates, nondeployable mine force ships and other less complex platforms are appropriate for consideration for the Naval Reserve Force.

SEALIFT R&D

Senator COHEN. Admiral Nyquist, $15 million was authorized and appropriated in fiscal year 1990 for research and development of improved sealift capabilities. It appears now that those funds will be used for other purposes. Did those funds lead to any new discussions between the Navy and private industry regarding desired sealift capabilities and features? If so, what did the Navy learn from those discussions?

Admiral NYQUIST. In response to the fiscal year 1990 authorization, the Navy established an interservice and interagency working group to guide technology development planning and determine characteristics for sealift ships. Under the aegis of this group, the Maritime Administration initiated an ongoing dialogue with the commercial operators to develop a sealift ship design concept that would be commercially viable while retaining essential militarily useful characteristics. That dialogue has produced the PD321 series of cargo ship design concepts, but those concepts are yet to undergo detailed review by the Navy working group to assess lessons learned.

DIESEL SHIP PROPULSION

Senator COHEN. What procedure does the Navy have or use for monitoring worldwide developments in diesel propulsion technology to large surface ships?

Mr. CANN. The Navy's (Naval Sea Systems Command) engine division has one dedicated, diesel oriented R&D engineer whose sole responsibility is to monitor diesel developments, and report on these developments to the Command. In addition, there is a diesel propulsion branch, responsible for fleet introduction and support of our diesel propulsion systems. All these engineers attend presentations on state-of-the-art engine/propulsion systems at U.S. and international technical society symposiums, as well as associate with engine manufacturers on a daily basis. Our engines division personnel also participate in technical data exchanges with allied foreign navies under formal agreements, along with making visits to major domestic and foreign engine manufacturers. They also receive many, publications that report on current domestic and world-wide developments in diesel engine propulsion technology, along with associated shipboard systems and components. These publications provide detailed coverage of new engine/installation designs, as well as improvements to standard production engines.

Senator COHEN. What are the several most powerful, state-of-the-art diesel engines currently being procured for commercial use world-wide? If four of these large diesel engines were employed together, what would be the potential shaft horsepower?

Mr. CANN. The largest diesel engine currently being manufactured in the United States is manufactured by Colt Industries. It is of French design (Pielstick) and is rated at 16,300 SHP at 400 RPM. Colt is licensed by Pielstick to manufacture an engine of the same family up to 30,000 SHP at 400 RPM, but this engine has not yet been built in this country. World-wide, there are currently three manufacturers of very large, slow speed (80–104 RPM) direct drive (no reduction gear), reversible diesel engines. The three manufacturers are: Fincantieri, Italy;, MAN/B&W, Germany; and Sulzer, Switzerland. These engines are known for their extremely reliable operation but due to their size and weight permit generally no more than one engine per ship. They have been used exclusively for very large merchant ships. The largest engine of this type produces approximately 67,080 SHP, weighs 1,820 tons and measures 70 feet in length, 16 feet in width and 46 feet in height. Four of these engines could develop approximately 268,320 SHP.

Senator COHEN. What research is the Navy currently conducting to investigate combined diesel and gas turbine propulsion?

Mr. CANN. The Navy is not currently conducting any research on combined diesel and gas turbine propulsion. We built a nominal 13,000 HP combined diesel or gas turbine (CODOG) propulsion plant into patrol gunboats (PG 84/92 classes) in the mid-to-late 1960s. We also built a larger diesel or gas turbine propulsion system on the PHM-1 class hydrofoils. These diesel and gas turbine propulsion plants demonstrated our capability to design, build and successfully operate this type system. The PC and PHM propulsion systems are similar in size and ship operating changeout (e.g., cruising range, etc.) to those of the foreign navies, but are small in comparison to what would be needed for a U.S. Navy frigate, destroyer or cruiser size plant. If the combined diesel and/or gas turbine propulsion system was chosen for one of these larger ships, we would construct a land based test site to shake down the system, particularly the control system which is one of the areas of greatest concern in a propulsion system of this type.

We consider combined diesel and gas turbine power plants on each new ship design. However, that type propulsion system is usually not chosen because of anti-submarine warfare noise requirements and/or weight, volume and cost of the system in comparison to a combined gas turbine and gas turbine system which is what we are currently using on our frigates, destroyers and cruisers.

The Navy is proceeding with development of improved propulsion system components that can be used in a combined diesel and/or gas turbine system. Some of these are the Intercooled/Recuperated (ICR) Gas Turbine and the rotary diesel engine.

SUPERSONIC LOW ALTITUDE TARGET (SLAT)

Senator COHEN. What is the relationship between the Supersonic Low Altitude Target (SLAT) now under development and the testing of the *Arleigh Burle* (DDG-51) class destroyer?

Mr. CANN. The SLAT vehicle provides an important acquisition appraisal tool for the Aegis program in satisfying required DDG-51 Developmental and Operational Test (DT/OT) objectives. SLAT is the only target system capable of replicating the existing and projected supersonic sea skimming anti-ship cruise missile threat. The SLAT will be used during all future development and acceptance tests of DDG-51 class destroyers. These tests have been repeatedly emphasized as pre-requisites to weapon system production funding decisions. The initial DT/OT testing of DDG-51 will occur next summer at the Atlantic Fleet Weapons Training facility. Planning is underway to include SLAT presentations in these test events.

Senator COHEN. What priority does the Navy assign to the continued development of SLAT?

Mr. CANN. The Director of Navy Requirements for Research and Development, Test and Evaluation has stated that SLAT is one of the highest priority test asset development programs. Without SLAT, the Navy will not be able to adequately stress shipboard AAW weapons systems during critical phases of operational testing that will ultimately support acquisition decisions.

INTEGRATION OF AIR DEFENSES

Senator COHEN. What is the status of the Navy's program to test the improved automation of air defense equipment on frigates?

Mr. CANN. The Navy program to test upgrades to the integrated air defenses aboard guided missile frigates is funded and proceeding according to schedule. A technical and operational evaluation of the Coherent Receiver Transmitter (CORT)/Integrated Automatic Detection and Tracking System (IADT) aboard the U.S.S. *Ingraham* (FFG-61) will commence on the west coast in October 1990 and will be completed by March 1991.

UNMANNED UNDERSEA VEHICLES

Senator COHEN. The Navy's unclassified report on unmanned undersea vehicles indicates a potential interest in untethered UUVs weighing in excess of 15,000 pounds.

In general, what modifications would be required in the design of new destroyers in order to provide handling equipment and stowage space if UUVs (in addition to towed sonars and towed countermeasures) were to be deployed from such ships?

Mr. CANN. The critical design consideration in the deploying of UUVs over the side of surface ships is lowering the UUV through the sea-surface interface under dynamic conditions. The design of an A-frame crane arrangement on new destroyers must be able to lower the UUV in prescribed sea state conditions at prescribed ship speeds so as to prevent damage to the UUV at water entry. It must also provide for the safety of the UUV handlers. Capture and recovery of the UUV onto the destroyer is equally as difficult. The weight handling considerations and the effect of the structure and equipment on stability and movement of the destroyer are secondary considerations. Finally, storage space for the UUV and a space (or carry-on van) to provide maintenance and logistics support for the UUV would be required. All these considerations must be made when deciding on the utility of UUVs for surface ships. This design review has not yet been conducted for new destroyers.

SEAWOLF (SSN-21) SUBMARINE

Senator COHEN. Mr. Cann, the Navy has requested authority to reprogram $178 million into the *Seawolf* (SSN-21) construction program. For the record, what are the reasons for requesting these funds? How will they be spent?

Mr. CANN. The $178 million request is required to correct the Government underestimate for the lead ship construction budget. A portion of the reprogramming is for material underestimates resulting from the extent of increased technical requirements in silencing, depth and shock, and related vendor qualification costs reflected in the awarded shipbuilding contract price. The first SSN-688 orders upon which *Seawolf* cost estimates were based, were for 12 ships allowing vendors to amortize qualification costs over a much larger order than the single SSN-21 order. Further, the SSN-21 has significantly greater numbers of components-requiring qualification because the SSN-21 incorporates so much new and innovative technology. Another significant cost factor contributing to the increase in SSN-21 material costs is the continuing erosion in the nuclear submarine and machinery and component vendor base over the past 20 years. Poor economic projections and declining shipyard workload also contributed to the increase, labor rates exceeded those estimated, and actual labor rate escalation at Electric Boat for fiscal year 1985 to fiscal year 1989 bidding years was more than double the OSD/OMB projections.

Senator COHEN. In addition to the $178 million, what other funding will the Navy require to build this ship? What would be the resulting new estimate for the cost of the SSN-21?

Mr. CANN. The $178 million request is the Navy's best estimate of funds required to complete the lead ship. Due to standard escalation provisions, in this contract, future economic conditions (inflation) and workload effects associated with decreased defense budgets, could cause the delivered price to be higher than currently estimated.

Senator COHEN. I understand that the reprogramming would fully fund the contract to the target price. What is the Government's potential additional cost (financial exposure) if the construction contract increases to the ceiling price?

Mr. CANN. $203M.

SUBMARINE DELIVERY OF SPECIAL FORCES

Senator COHEN. What capabilities do the two SSN-688 class submarines possess for delivery of special forces? When will those ships likely be retired and what plans does the Navy have for replacing them?

Admiral COOPER. The two SSN-688 class submarines have been modified to carry the Dry Dock Shelter (DDS), from which either a single Swimmer Delivery Vehicle (SDV) can be launched and recovered or a mass swimmer lockout or lockin can occur. The U.S.S. *John Marshall* has been modified to carry two DDSs at a time. The U.S.S. *Sam Houston* can currently carry only one DDS. Its modification for the dual DDS capability was canceled due to the short length of its remaining operational time.

The U.S.S. *Sam Houston* will become materially restricted to surface operations in early fiscal year 1991 and so will be retired as soon thereafter as possible. The U.S.S. *John Marshall* will be retired in fiscal year 1992. Six 637 long hull class SSNs are currently being modified to have a single DDS capability. Two are complete and the remainder will be complete by fiscal year 1992. A total of six DDSs are being built by the Special Operations Forces. Options to convert two C-3 SSBNs to dual DDS capable SSNs in the future are being evaluated as part of the POM process.

AMPHIBIOUS ASSAULT SHIPS

Senator COHEN. What can you tell us at this time about the characteristics of the planned future amphibious ship, the LX? What process did the Navy and Marine Corps use to determine these qualities?

Admiral NYQUIST. The retirement of old, obsolete amphibious ships in the next decade requires that new ships be built to replace corresponding lift capacity. All LPH, LKA, LPD, LSD-36 and LST class ships reach service age by 2007, with 38 ships retiring between 2004 and 2007.

Amphibious lift consists of five major elements:

Troop berthing (bunks)
Vehicle (square feet) stowage
Cargo (cubic feet) stowage
Airspots to park and operate aircraft
Landing Craft Air Cushioned operating spots

The future shipbuilding program must deliver the right balance of the fingerprint elements so as to provide the required efficiency.

The process of determining what combination of ships to build consists of determining the lift required for notional forces; projecting lift shortfalls after delivery of ships already paid for; and analyzing the tradeoffs between continuing to build ships already designed or designing new ones.

LHD-1 and LSD-41 (Cargo Variant) lift fingerprints do not individually or collectively match requirements that emerge after retiring of block obsolescence ships. LX class ships will have design characteristics that correct shortfalls particularly in vehicle and LCAC spots, Amphibious force total lift capability will then closely match USMC requirements when planned numbers of LX come on-line. The preliminary design process for the LX is ongoing. Its characteristics will be similar to today's LPD-4 class. An order of magnitude estimate of LX lift capacities is:

650-1,000 Troops
22,000-35,000 Vehicle square feet
22,000-35,000 Cargo cubic feet
Carry and operate up to 4 helicopters
1-3 LCAC spots

Senator Cohen. Why is it important to proceed with the LX program?

Admiral Nyquist. LX is designed to fulfill amphibious lift shortfalls that will result from the significant block obsolescence of ships in the next decade. LX provides, in the right proportions, amphibious lift characteristics which include capacity for troops, vehicles, and cargo as well as flight deck air spots for aircraft and well-deck spots for LCAC. Without sufficient numbers of LX class ships, significant lift shortfalls will result. Neither more LSD-41/49 or LHD-1 class ships will correctly fill the lift shortfalls beyond year 2003.

Senator Cohen. What funding has been requested in fiscal year 1991 for design work associated with the LX, and under what program element? Given the requested level of funding for design work, what is the earliest year that procurement of the LX could be funded?

Admiral Nyquist. For fiscal year 1991, $1.5 million has been requested for preliminary design work on LX under program element 63564N/S0408. With design money for LX at this level, 1996 is the earliest procurement year for LX.

AMMUNITION SHIPS

Senator Cohen. What ammunition ships (AEs) are now in the inventory? How old are they? What is the Navy's requirement for AEs?

Admiral Nyquist. Based on the UNREP 1988 study, the Navy's requirement is 16 AEs in a shuttle ship role to support 15 battle groups. The following chart identifies present AE assets and age:

SHIP	AGE (YEARS)
SURIBACHI (AE 21)	33
MAUNA KEA (AE 22)	33
NITRO (AE 23)	31
PYRO (AE 24)	31
HALEAKALA (AE 25)	30
KILAUEA (T-AE 26)	22
BUTTE (AE 27)	21
SANTA BARBARA (AE 28)	20
MT HOOD (AE 29)	19
FLINT (AE 32)	18
SHASTA (AE 33)	17
MT BAKER (AE 34)	17
KISKA (AE 35)	16

TOTAL AEs = 13 / AVERAGE AGE = 24 YEARS

Senator Cohen. What is the estimated cost to build new ammunition ships? If the exact figures are not available, provide a best estimate.

Admiral Nyquist. A best estimate cost to build a new ammunition ship (AE) is $391M. This is a single ship price. Multi-year contracts may entice greater competition and produce an undefined amount of savings.

Senator COHEN. What potential exists to purchase C-9 class container ships from commercial operators and to convert them to military use as ammunition ships? Has the Navy inspected such ships?

How similar are the propulsion systems of the C-9s and existing AEs?

What might such ships cost to acquire? What would be the cost to convert them, if military specifications were "tailored" or modified to accommodate minimum requirements?

Admiral NYQUIST. The Navy has not inspected such ships because construction of the C-9 container ship which operates as a point-to-point container transport ship does not lend itself to the mission of safe ammunition stowage, staging and underway replenishment of fleet combatants.

The propulsion systems for C-9s and existing AEs are very different. The main propulsion system for C-9 container ships is diesel propulsion and for existing AEs, steam propulsion.

Cost for C-9 container ship acquisition and conversion to meet military specific requirements cannot be estimated without study.

Senator COHEN. Do the existing AEs comply with the military specifications which would be applied to new construction AEs?

Admiral NYQUIST. Yes.

MILITARY SPECIFICATIONS

Senator COHEN. Who is responsible for determining military specifications for equipment installed on U.S. Navy ships?

Mr. CANN. In general, ship program managers determine specification requirements for their respective ship classes, employing assistance and guidance from appropriate engineering divisions in NAVSEA. There are exceptions, such as standard equipments and specifications that are required aboard Navy ships by policy for all of the sound reasons for standardization (e.g., interchangeability, interoperability, economic reasons). To deviate from these standards, a program manager must have concurrence from the commodity life cycle manager.

Senator COHEN. Who has the authority to waive those specifications?

Mr. CANN. In general, ship program managers. For certain specifications, the program manager must have the concurrence from the commodity life cycle manager.

Senator COHEN. How would you describe the current level of effort allocated for reviewing and tailoring (i.e., reducing) military specifications for this equipment?

Mr. CANN. The Navy, in support of the Defense Standardization Program and under the banner of the Acquisition Streamlining initiative, has been actively reviewing, in concert with the other services and industry, all of the military specifications to determine validity and need. Our goal is to emphasize performance versus "how to" requirements and ensure that documents imposed in acquisition programs are tailored to reflect only particular needs consistent with mission requirements. It is Navy policy that each program manager streamline his program requirement. To this end, we have been conducting specification streamlining training for Navy acquisition personnel for 5 years and will continue to do so. We have seen significant program cost avoidance figures as a result of Acquisition Streamlining. Additionally, a DOD and industry wide survey is being conducted to determine the areas of specifications which could give the maximum return on investment if improved. This will help us focus our scarce personnel resources where most needed. The Navy also supports DOD policy to encourage the use of Non-Developmental Items (NDI) and commercial products in military applications where practical and feasible.

[Whereupon at 12:20 p.m. the subcommittee was adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1991

TUESDAY, JUNE 12, 1990

U.S. Senate,
Subcommittee on Projection Forces
and Regional Defense,
Committee on Armed Services,
Washington, DC.

STATE AND CAPABILITIES OF THE UNITED STATES MARINE CORPS

The subcommittee met, pursuant to notice, at 10:05 a.m., in room SR-222, Russell Senate Office Building, Senator Edward M. Kennedy (chairman of the subcommittee) presiding.

Committee members present: Senators Kennedy, Exon, Dixon, Warner, Cohen, McCain, Gorton, and Coats.

Committee staff members present: Marie Fabrizio Dickinson, Assistant Chief Clerk.

Professional staff members present: Creighton Greene, and John J. Hamre.

Minority staff members present: Romie L. Brownlee, deputy staff director; George W. Lauffer, Durwood W. Ringo, Jr., and Mark B. Robinson, professional staff members.

Staff assistants present: Lori M. Jackson, Mary J. Kampo, and Kelli J. Pronovost.

Committee members' assistants present: William J. Lynn, assistant to Senator Kennedy; Andrew W. Johnson, assistant to Senator Exon; Milton D. Beach, assistant to Senator Glenn; Terence M. Lynch, assistant to Senator Shelby; Dale F. Gerry, assistant to Senator Cohen; Christopher K. Mellon, assistant to Senator Cohen; Anthony H. Cordesman, assistant to Senator McCain; Robert M. Soofer, assistant to Senator Gorton; and Eric H. Thoemmes, assistant to Senator Coats.

OPENING STATEMENT OF SENATOR EDWARD M. KENNEDY, CHAIRMAN

Senator Kennedy. We will come to order.

I want to welcome General Gray to the Projection Forces Subcommittee once again. As in past years, we look forward to his testimony about the status of the Marine Corps.

Much has changed since General Gray's appearance last year. The Berlin Wall is history. The Warsaw Pact has ceased to be an effective military alliance, and democracy has triumphed throughout Eastern Europe. These events have brought us into a new strategic environment. The threat of the East-West conflict that has dominated our military planning for over 40 years has been dramatically reduced. This historic shift will permit substantial reductions in the U.S. defense budget. As a result, more funds will be available for the domestic priorities that we have underfunded during the past decade.

But as we reduce the defense budget, we must be careful to target cuts at the forces where the threat is diminished. The biggest mistake that we can make now is to apply a Gramm-Rudman principle to the Pentagon and cut each military service and mission equally regardless of its relevance to our future security needs.

The principal reductions should come in areas where the threat to our security has been most clearly reduced—our strategic nuclear forces and our European based ground, air and Navy forces. We should protect the light air, more mobile forces that will continue to be needed to meet likely threats in various parts of the world.

The dramatic events in eastern Europe and the Soviet Union have not changed two fundamental realities. First, the world remains a dangerous place. Thousands die each year in Third World battles described as low intensity conflict. The dangers of even greater regional strife exist in the longstanding animosities that continue to plague Pakistan, India, Iran, Iraq, Israel,and its Arab neighbors. The proliferation of nuclear chemical and biological weapons adds to the threat of mass destruction in each of these potential conflicts.

Second, the United States has and will continue to have worldwide responsibility and interest that will require well-trained and properly armed military forces. To ensure stability, we must maintain our important alliances in Europe and the Pacific. To protect our global trade network, we need a strong Navy, and to defend our interests wherever they are threatened, we need to be able to project our military power to the most remote regions of the world.

It is in this last mission that the Marine Corps excels. Today a Navy amphibious group with 2,000 Marines is stationed off the coast of Liberia to ensure that Americans can be evacuated if the current civil war interest intensifies. The mobility and flexibility of our Marine amphibious forces are among the most important guarantees we have of the safety of our diplomats and civilians living abroad.

General Gray, again, welcome. Before we hear from you, I will ask Senator Cohen or Senator Warner to make what remarks they would.

Senator COHEN. Thank you, Mr. Chairman.

General Gray, after the Chairman's opening statement, I think the best thing you can do is leave the room and refuse to testify—[laughter]—because it certainly sounded like a resounding endorsement of not only the past role of the Marine Corps, but the future role of the Marine Corps as well.

I would say that General Gray has never hesitated to come before this subcommittee and express his candid views on what is required to meet the nature of the threat that the United States might face even now or in the future.

A lot of talk has been devoted, certainly by the Chairman and myself, to the concept of low intensity conflict. Whether you call it special operations or low intensity conflict or irregular warfare or I believe what General Gray calls unconventional warfare, it seems to me that those are the kinds of conflicts we are likely to face in the future.

I, as well as the Chairman, look forward to hearing your views, General Gray, in terms of what the Marine Corps will need in order to carry out a mission by whatever name we call it in terms of sealift, airlift, and overall capability.

Thank you, Mr. Chairman.

Senator **KENNEDY**. Thank you very much. Senator Warner?

Senator **WARNER**. Thank you, Mr. Chairman. I have come to join you here this morning to pay my respects to this distinguished commandant, another in a long line of distinguished commandants of the Marine Corps.

General, you will recall in February when you appeared before the full committee, that I raised questions about roles and missions and the need for what I call a surveillance by the Congress and, indeed, the leadership from the President on down as we begin to reduce the military to make certain that there is not an inducement to build up in other branches of the service a capability to compete within the overall total force structure. Now, the Marine Corps is trained in mobility, versatility, and as the Chairman and Senator Cohen said, in quick response time. It is in place and it is ready to go today, and we do not need to build up any redundancy in other elements of the Armed Forces of the United States.

I pledge to you today, as I did in February, to be a part of that oversight team to make certain we cannot in this time of stringent budgets have any unnecessary duplication of that type in the forces of the United States.

A job well done, sir.

General **GRAY**. Thank you, sir.

Senator **KENNEDY**. I would like at this time to have Senator Dixon's statement and Senator Lott's statement inserted in the record.

[The prepared statement of Senator Dixon follows:]

PREPARED STATEMENT OF SENATOR ALAN J. DIXON

Mr. Chairman, I am delighted that the committee is going to receive testimony today on the state of the U.S. Marine Corps. I welcome our distinguished witness, the commandant, General Gray.

In this time of rapid change, Congress must receive as much information as possible on the status of all components of our armed services. I believe that this hearing provides an excellent opportunity for the committee to obtain this type of update from the Marine Corps.

This information is especially important because the distinguished Chairman of this Committee has suggested that a competition for roles and missions within the armed services should be included in a new U.S. defense strategy. I certainly agree that we must seriously reexamine U.S. defense strategy if we are to adapt successfully to a world in transition. However, I would add that I do not want to see the Army duplicating the roles and missions of the Marine Corps. While the Army must, of course, make adjustments, it would make no sense at all—and moreover it would be a big waste of money—to create what would essentially be two Marine Corps.

We face a great deal of uncertainty in determining the nature of threats to U.S. national security in the new world that is emerging. However, many argue that the types of threats that the Marine Corps has traditionally played a prominent role in addressing—so-called low intensity conflicts in the Third World—will continue unabated. In fact, some speculate that these types of threats will actually increase as U.S.-Soviet competition declines and superpower involvement in other regions of the world decreases. Given these arguments, I believe it is safe to assume that we will continue to have a large need for the Marine Corps.

Additionally, as we inevitably reduce forces deployed overseas, the importance of U.S. force projection will become even greater. Thus, I am encouraged by General Gray's statement in his written testimony that "in an era of decreasing access to overseas bases, it is imperative that we exploit fully the capability provided by our mobile sea based forces." The Marine Corps is obviously a critical component of our force projection capability.

Within the context of these continued and new requirements for a healthy and strong U.S. Marine Corps, I have some questions about the administration's apparent future plans in this area. For example, is the Defense Department's reported plan to cut 37,000 marines a wise move? Also, are we placing enough of a priority on amphibious shipping? I hope that we will be able to address these and other concerns during this morning's hearing.

Mr. chairman, I look forward to hearing from today's witnesses.

PREPARED STATEMENT OF SENATOR TRENT LOTT

Thank you, Mr. Chairman.

General Gray, it is a pleasure to welcome you in your appearance before this subcommittee. I hold all of our armed services in the highest regard, but I must admit that I have a special admiration for the Marine Corps and its historic warrior tradition. From what I have seen, your style of leadership measures up to that tradition.

The international security environment is evolving at a remarkable pace as the character of the threat to U.S. interests changes from primarily superpower competition to a more even array of threats to the United States and our allies. Changes aside, the important thing to remember is that threats will remain. We must retain the capability to deter potential enemies and when deterrence fails, to protect our interests with force. The Marine Corps is one of the instruments essential to fulfilling this mission.

One enduring truth in these times of change is the United States role as a maritime nation. As we continue to move toward an increasingly global economy, freedom of passage along sea lines of communication will be even more essential to our national interest. The Navy-Marine Corps team is the guarantor of that time-honored concept—freedom of the seas.

The Marine Corps also provides a power projection capability that is unique in that it does not rely on extensive foreign basing—a major advantage in a world that is increasingly less hospitable to U.S. military bases on foreign soil. Embarked Marine Expeditionary Forces just over the horizon from a trouble spot can provide a powerful influence on international events with reduced risk. In addition, this kind of presence has "staying power" that other forms of force projection do not enjoy. A recent example of this is the Marine Expeditionary Force deployed off the shores of Liberia in order to evacuate American citizens should the need arise.

In sum, the Marines are a good investment under a vast number of possible contingencies. Our job in the Congress is to insure that they are well equipped and have the strategic mobility to deploy quickly to where they are needed.

Senator **KENNEDY**. General Gray, we welcome you here and look forward to your comments.

STATEMENT OF GEN. ALFRED M. GRAY, COMMANDANT OF THE UNITED STATES MARINE CORPS

General **GRAY**. Thank you, Mr. Chairman.

We have prepared a statement for this hearing which is our view of the changing world situation and talks about the types of capabilities that we believe our great Nation needs not only for the rest of this century, but as we prepare to steam into the next century. We have looked downstream in the preparation of this statement, and we believe that it is a comprehensive analysis of the types of capabilities that America needs. We specifically did not talk about your Marines, but more importantly talked about the need for general purpose forces, and special operations capability, the need for crisis response capability, the need for stability operations, the need for flexibility, mobility and, as we like to say about your Marines, our requirement to provide forces that have aggregate usefulness. I would ask that that statement be entered in the record.

Senator **Kennedy**. It will be so included in its entirety as if read.

General **Gray**. With your permission, Mr. Chairman, we provided a little booklet for you. I would like to go through this very quickly. I think it captures what we are all about and it captures our view on the need for a maritime capability for a maritime nation and the need for flexible, useful naval power, in concert with the other elements of our armed forces.

[The booklet referred to is retained in committee files.]

And the first picture would, of course, draw our attention to the sea lines of communications and the various strategic choke points. These have not changed, as we know. Geography has not changed. And, although we have seen dramatic change in the Soviet Union and the potential for more, it remains very, very clear that we are dependent upon these highways we call oceans; that back and forth across these highways move the materials, resources and the items that our great country needs, in my judgment, to survive as a nation and perchance flourish economically. This is what maritime capability and naval power is really all about. We cannot protect the sea lines of communications without effective amphibious and expeditionary forces.

I would give but one example. The reason it was so difficult to operate in the Persian Gulf is because we did not, because of political and other considerations, control the land on either side of this narrow strait of water, as you know and observed during your visit; nor did we control the air space around that to the degree necessary. Therefore, it was a very dangerous and difficult operation. You must be able to control the choke points and you must be able to exercise surveillance, reconnaissance and, indeed, control of the ground, when necessary. Your Marines are a very important part of the sea lines of communications mission.

If we could move to the next viewgraph, you will see a simple display of where many of the strategic resources are. Where the oil and other precious minerals are located. That too has not changed. Although we always look forward to some additional sites of exploration, and discovery, the fundamental facts remain, that depicted here in general form are where the minerals, resources and other strategic materials are located that we in the free world must have access to; if we, indeed, want to flourish.

On the next chart is a simple picture of the world, if you will, with black dots which show where your Marines and naval forces have been involved in responding to crises since the end of World War II; a very formidable number. In over 80 percent of these crises our naval forces have been involved; and Marines in almost 60 percent of that. The majority of these crises have been independent of the Soviet situation for the most part; although, some have been supported by them.

On the next chart we see where today's instabilities are located. Clearly, they are in the lesser developed regions of the world;

where the resources are to which I alluded earlier. Again, as we look to tomorrow and the rest of this century, we really do not see too much of a change in the potential for instabilities in areas like the Mideast and the great continent of Africa. In these areas poverty, starvation, and nationalist fervor are the primary contributing factors to instability. With respect to Central and South America, there has been some change in recent months as we know, but there still remain many of the ingredients of instability. Likewise in Southeast and Southwest Asia.

If we can move to the next viewgraph. With today's instabilities as a background and the flimsy over-top, you see where your naval forces, and particularly your Marines, your landing forces and expeditionary forces, have been operating and training. Today there is an enormous similarity between these operations and the focus of your Corps. These operations include crisis response, presence operations, humanitarian operations, evacuations, and stability operations.

This I think is what you would expect. This is what, in my judgment, the Congress had in mind when they amended the law in 1952; when they directed that your Marines be organized, trained and equipped into three air-ground teams on active duty and one in the Reserves for the kinds of crises, the kinds of contingencies, the kinds of events that go on worldwide; that require military presence, military capability and military decisiveness.

The next viewgraph tells you where your Corps of Marines are today. These are the Spearpoints. You can see that we have Marine expeditionary forces and capability located in key areas throughout the globe. Our II Marine Expeditionary Force is based on the east coast with responsibilities for the Atlantic, North and South, the Mediterranean, Europe and wherever the unified commanders need them. The I Marine Expeditionary Force, based on the west coast, has responsibilities for the Eastern Pacific and the Western Pacific. And not mirror image, but with a smaller, leaner capability, forward deployed aboard ships and in Okinawa is the III Marine Expeditionary Force.

There are also three red dots. These are very important, right now, because they signal the location of the maritime prepositioned ships or maritime prepositioned force. This is a very good capability, one that has been added to our capability in the last 10 years. These are sets of ships, four and five, as the case may be, each with the equipment, supplies, logistics, and sustainability to support a Marine air-ground task force of 16,000 to 17,000 people each. They complement our amphibious capability, power projection capability, and above all, they add to our global response capability. They certainly give us the capability to do things much quicker, no matter where we are called upon throughout the globe. That has been one of the key points. We have made significant enhancements in our ability to respond rapidly.

The next chart depicts another organization or capability not generally well-known. These are Marine Security Forces and our Marine detachments. These too are combat forces. These organizations are made up of commando type Marines, who provide security throughout the world for vital naval installations. They also provide security and anti-terrorist capability for nuclear arming and nuclear refueling. They also participate in contingency operations as our force did in the Philippines when the ambassador wanted to be reinforced during the recent coup attempt late last fall. Within an hour, 100 combat Marines from this force were surrounding the embassy, providing additional security.

The next viewgraph, a little better known, perhaps, are our Marine Security Guards located around the world in 129 countries, in all of the time zones. They are specially trained warriors, basic commandos with additional security training, trained in how to protect embassies and Americans abroad, while training for a wide variety of other contingencies.

The next chart simply reflects, in another way, our global and maritime thrust. Here you see three Marine Expeditionary Forces and their general areas of interest, again along the littorals where most of the world lives. They are prepared to conduct whatever operation might be required. The green dots are affiliated with a particular force and show, in a 60-day snapshot taken this winter, where these forces were operating and training. The First Marine Expeditionary Force is depicted by the green dots, with the Second Marine Expeditionary Force, in yellow dots, throughout Central and South America, Africa and stretching to Norway, and in blue dots, the Third Marine Expeditionary Force in the Far East operating throughout Southeast Asia and the North and South Pacific conducting operations and training with our allies.

The point I would make with this and the earlier charts is simply this: one-third of your Marine Corps is forward deployed, at sea or in forward operating bases doing what must be done. One-third has just come back, and one-third is getting ready to go. One hundred twenty-two thousand Marines are in the Marine Expeditionary Forces and 11,000 more are in the Marine Security Force and Marine Security Guards. So, the preponderance, over 70 percent of your Marine warriors are in the operating forces, either deployed, preparing to deploy or just returning from a long deployment. These deployments, I allude to, are at least 6 months without families and dependents. We are an operating outfit.

The next chart is busy, but it illustrates the deployment options that the Department of Defense, with the superb support of the Congress has given your Corps of Marines in this past decade. For example, when you take our amphibious lift capability and marry it to the maritime prepositioned ship capability, knowing that we can operate this prepositioned capability with airlifts of only 250 aircraft for this large 16,000 to 17,000 man brigade, you can see again the global reach in another way. You can see the responsiveness and the sustainability that we bring to a theater for operations.

In recent months we have fine tuned this capability through deterrent force modules and crisis action modules. For example, if you told me or the unified commander tonight: "Put Marine forces and capability in the Philippines for a crisis." We could put a large air-ground task force of 15,000 to 20,000-man brigade configuration in a day; and, a 35,000 man Marine expeditionary force in a week. That is the kind of flexibility, usefulness and mobility that we have today.

The next chart is simply a status of the Corps. Our active force requirement this morning is 220,000 Marines with a peacetime manning authorized strength by the Congress of 197,000. The fiscal year 1991 budget request from the administration is for 196,500. That is where we are today. You can see again 122,000 in the expeditionary forces, with another 11,000 providing security forces and diplomatic security; all with a wide range of capabilities. We can go by sea, air, or combinations thereof, and fly across the vast oceans with our tactical support aircraft.

Most importantly, we have continued to organize, train and focus our forces on the most likely kinds of conflict. The toughest commitment that we face are for two large Marine Expeditionary Forces in global conflict—be it in Europe, the Pacific or both. As we note there, your Marines can do that this morning. We can operate for 60 days anywhere we have to go, and we are not dependent on the mobilization of a single person for that initial 60 days. So, readiness, capability and flexibility are there.

The next chart, I believe, is quite important because it shows continuity with respect to the sense of the Congress. If you look at that chart, it tells you that the average strength of the Marine Corps has been about 195,437 since the 1952 law. If you take the Korean expansion out of the figures, take the Vietnam War expansion out of the figures, you see again a steady average of over 182,000 Marines.

So, when your Commandant reports to you, today, that we need about 196,000 Marines; as he looks through the rest of this century and says that 190,000 would be really the kind of force we would like to see, which was our goal before the buildup in Indochina and Vietnam. When we look at all of the things that must be considered over time in our long-range snapshot for your Corps of Marines, we have said that by the end of the century, we should have at least 180,000 to 182,000. We believe that we are in the arena, if you will, with respect to the kinds of forces that are needed.

The next chart simply depicts what some people have had to say. We see General Galvin pointing out the need for naval power and expeditionary forces in a post- CFE or CSCE environment. We see that marines and sailors, with their amphibious warfare capability and strike warfare capability have been the forces of choice in the Mideast crises we have faced. We see the need for amphibious forces and the selection, therefore, of our special operations capable units for the Rangoon crisis. And, of course, we have alluded to the Liberian crisis today. It is noteworthy, I think, that your Marine special operations capable forces were also the force of choice for a very specific special operations mission, consistent with the crisis in the Philippines.

So, in summary, Mr. Chairman, our position would be that we have organized, trained, equipped and postured the forces for the most likely kinds of conflict. We believe very strongly that our general purpose forces must be able to carry out a wide spectrum of special operations, as Senator Cohen has alluded to. Our forces are leaning forward today for the mid and low intensity type conflicts, as they have been described. As always, I would remind all that there is no such thing though as low intensity violence; and, that in these lesser developed regions, where most of these conflicts occur, are an awful lot of sophisticated weaponry. There are capabilities that can do damage in a hurry. We must, therefore, have a balanced thought process as we go through the next difficult years with respect to defense resources.

[The prepared statement of General Gray follows:]

STATEMENT OF
GENERAL A. M. GRAY
UNITED STATES MARINE CORPS
COMMANDANT OF THE MARINE CORPS

Mister Chairman, members of the Committee, it is a pleasure to appear before you to present our views with regard to the future security needs of our Nation. Marines have been focused on the issues currently being discussed for quite some time. We welcome the opportunity to participate in this most important dialogue.

As we have stated in previous testimony, our security environment is changing dramatically. In some respects the Soviet Union is no longer perceived to be the military threat it once was. In our view, the near term risk of nuclear or conventional conflict with the Soviet Union is low, however, there remains a significant degree of uncertainty with regard to the effect of change within the Soviet Union on worldwide stability. Since it is not possible to predict with absolute certainty Soviet reaction to internal and external change, it is prudent to maintain, albeit at reduced levels, the nuclear and conventional capability needed to deter aggression, maintain stability, encourage and sustain reform, and respond to crises resulting from unforseen circumstances in Europe. As we review our military force requirements in light of the changes in Europe, we must remember that our Nation will be the primary contributor to global stability. Our ability to encourage stability is directly related to our commitment to maintain an operationally balanced military force that has the flexibility, readiness, and sustainability needed to fulfill the needs of our Nation in a changing and unstable world.

Rising nationalism and emerging new economic and military powers will result in a multi-polar security environment. Growing dissatisfaction with the gap between rich and poor nations, drug trafficking, terrorism, and increased competition for scarce resources continue to cause instability throughout the world. Instability will be fueled by the erosion of the current bi-polar balance of power and by the unchecked proliferation of advanced weaponry throughout the world. As a result, our global economic and political interests will be threatened. Conflict across the spectrum of violence occurring simultaneously in more than one region is a definite probability.

The changing security environment provides the opportunity to balance our military capabilities with our security requirements. It allows us, once again, to match our strategy with the maritime character of our Nation. The challenge is to have a military strategy and force structure, within the limits of available fiscal resources, which permits us to maintain international stability and respond to crises without assuming an unacceptable level of risk. The critical steps in our force structure requirement process are: Identification of our interests, Assessment of the threat, Formulation of a strategy which is responsive to both our short- and long-term security needs, and An assessment of our existing capabilities.

Americans have never, nor will they now, tolerate a significant reduction in our Nation's status as a superpower - politically, economically, or militarily. They expect our leaders to maintain this status by matching requirements with the resources available. If we are to be successful in this endeavor, we must maintain a balance between all the elements of our national power. History has shown that no political or economic world power ever has maintained this status without a credible military capability. The key to our success will be the maintenance of an affordable military force structure that provides the needed strategic and operational flexibility. Accordingly, the question we must answer is not, "Are military forces required?", but rather, "How much military force is sufficient?"

The President's March 1990 National Security Strategy of the United States, recently published defense planning guidance, and statements and articles released by several congressional leaders have called for an increased reliance on mobile, highly ready, well equipped forces. These forces must be able to deter aggression or stabilize potential crises by their presence as well as be capable of conducting forcible entry power projection operations where required. It is our view that the needs of our Nation, the character of our Nation, the requirement for flexibility, and the diverse nature of the threats to our interests require that our military strategy have a maritime focus. Our reliance on the sea lines of communications for our economic and security needs, the expected decrease in the number of overseas bases and overflight rights, and the need, at times, to act independently coupled with the fact that the majority of potential conflicts will be accessible from the sea, substantiate this view.

If our military strategy is to meet the needs of the Nation, it must have an operational focus. Our military strategy must address all aspects of the threats to our interests to include: conventional and nuclear deterrence, conventional and nuclear conflict, terrorism, and drug trafficking. The basic tenets of our national security policy will continue to be deterrence, coalition warfare, forward defense, and force projection. Building upon these tenets we must develop a military strategy and force structure that is responsive to the emerging security environment. It also must have the inherent flexibility to respond to unexpected changes in our security environment and have global utility across the spectrum of conflict. The unique demands of this new environment require that we be innovative in our approach and place emphasis on conventional deterrence and crisis response. Accordingly, key aspects of our revised strategy must be readiness, presence, mobility, sustainability, and the concept of sequencing.

Our ability to deter and respond to crises is directly related to our potential adversaries' perception of our will and capability to respond to unacceptable acts against our interests. To be successful in these areas we must continue to maintain forces that have the highest state of individual, equipment, and unit readiness. To be credible they must be in position or have the capability to respond rapidly. Equally as important, these forces must be sustainable.

Recognizing the limits of available defense resources, we must look at the most cost effective way of fulfilling our defense requirements. One way of achieving this end is through the maintenance of military forces at different levels of readiness. This concept, which we call sequencing, requires that we maintain within our active structure a sufficient level of forces at a high state of readiness to deter conflict, meet recurring operational commitments such as forward deployments, counter drug and security assistance operations, and respond to multiple crises. These forces must be flexible and they must possess the combat power and sustainability either to resolve the crisis or buy the time needed to introduce follow-on forces. Fiscal responsibility requires us to capitalize on existing capabilities, optimize our active and reserve force structure, and avoid structuring all of our forces for a specific threat or region.

Today, our existing naval forces are capable of fulfilling a significant portion of our current and future defense requirements. These forces are unique in their capability to deter or respond to the types of threats and likely conflicts of the future security environment. Their mobility, readiness, and self-contained sustainability allows them to be where needed around the globe uninhibited by a reliance on overseas bases or access rights. Their ability to conduct operations across the spectrum of violence ranging from nation building to offensive power projection operations provides our Nation with the military credibility and capability needed to discourage potential adversaries, and should deterrence fail, to respond to acts of aggression against our citizens and interests. In an era of uncertainty and change, our aircraft carriers, naval gunfire support ships, amphibious ships, Maritime Prepositioning Ships, and Marines of our balanced fleet, provide the warriors, the floating air bases, infantry base camps, tank and artillery parks, ammunition dumps, maintenance facilities, hospitals, and command, control, communications and intelligence facilities needed for strategic flexibility. These mobile sea bases, and the forces they house, project, and sustain, provide our Nation with a competitive advantage of unmatched utility.

Throughout our history, naval forces have quietly and effectively deterred and responded to crises throughout the globe. Since World War II, in over 80 percent of all international crises, United States Naval Forces - aircraft carriers, amphibious ships, and Marines - have been the force of choice. When needed, they were ready and postured to respond. These responses have been primarily at the low- to mid-intensity level of violence and have included deterrence, diplomatic, and offensive power projection operations. Today, your Marines and Sailors continue to be forward deployed around the globe, providing the capability to defend our interests along the front lines of freedom.

This type of capability did not happen by accident. Our congressional and defense leaders have recognized and continue to recognize the strategic and operational flexibility provided by naval forces capable of adapting to uncertain geopolitical situations and threats. To quote from language authored by some of your predecessors in this body:

> "American history, recent as well as remote, has fully demonstrated the vital need for the existence of a strong force in readiness. Such a force, versatile and fast moving, and hard hitting, will constantly have a powerful impact in relation to minor international disturbances -- contingency response. Such a force can prevent the growth of potentially large conflagrations by prompt and vigorous action during the incipient stages. Such a ready force, highly mobile, always at a high state of readiness can be in position to hold a full scale aggression at bay while the American Nation mobilizes its vast defense machinery."

These words of the 82d Congress were used to prescribe the structure and organization of your Corps. We have used them to build, maintain, and improve our capabilities to react to short notice expeditionary tasks which have arisen in the past and which will continue in the future. In short, the structure and strength of the Marine Corps was, and continues to be, based on our Nation's need for an expeditionary force-in-readiness. With this in mind, our capabilities and utility are based on several factors: Marines, operational and organizational flexibility, readiness, innovation, and lift (deployability).

Throughout the history of your Corps, the individual Marine has been the cornerstone of our organizational strength. Marines, regardless of their professional military specialty, are trained to be riflemen. Their strength has been, and continues to be, their operational versatility. This is a direct result of our efforts to avoid unnecessary specialization, to maximize our Marines' operational experience, and to keep the number of Marines assigned to non-operational billets to a minimum. To illustrate this point, over 70 percent of the Corps' personnel strength is assigned to our operating forces. As a result, with a relatively small general purpose force, we are able to provide the Nation a tremendous amount of strategic and operational flexibility for a very small percentage of the defense budget.

Your Marine Corps is not an operationally hollow force. All of our expeditionary forces have within their organizational structure the combat support and combat service support forces needed for sustained operations. Therefore, manpower reductions not only affect our ability to man our Marine Expeditionary Forces but they also diminish our ability to provide other needed operating forces, such as mobile training teams, Marine Security Guards, fleet security forces and support forces.

Our three active Marine Expeditionary Forces and one reserve division - wing - logistic team provide the strategic flexibility needed to protect our interests and achieve our objectives in a changing and uncertain world. Our current end strength gives us the capability to meet operational requirements by providing the resources to keep one-third of our operating forces forward deployed, a third in pre-deployment training, and a third in post-deployment stand down. This structure provides the operational flexibility and capability to maintain deterrence and, when needed, to respond to crises in multiple regions around the globe.

Our forces are specifically designed for the types of conflicts and operations which will dominate the envisioned security environment. The organization and strength of your Corps was, and continues to be, structured to respond primarily to threats throughout the world separate from those posed by the Soviet Union and the Warsaw Pact. Thus, as the Soviet threat diminishes, it makes sense to capitalize on and continue to maintain these forces which have been created and organized specifically to contend with the types of crises which have been predominate in the past, and which will continue into the forseeable future. Our Marine Air Ground Task Force concept gives us the capability to task organize a multi-mission capable integrated air-ground-logistic force under a single commander that can be sized for a wide range of missions. This operational concept of a tailored ready force exploits the combat power inherent in integrated air-ground operations. It was specifically designed to deal with contingencies short of general war.

Today, utilizing existing forces, your Corps can provide Marine Air Ground Task Forces (MAGTFs) ranging in size from Small Special Purpose MAGTFs to multi-division/wing MAGTFs. These general purpose forces can be employed, either independently or as part of a Joint Task Force, across the spectrum of conflict. Our MAGTFs have the specialized training to conduct nation building, counter-narcotic, or counter-terrorist operations. They possess the combat power and sustainability either to resolve a crisis or seize and hold the beachheads, ports, and airheads needed for the introduction of follow-on forces.

Readiness has been, and remains, your Corps' first priority. Training and education are our primary means of maintaining and improving readiness. As an expeditionary force, Marines must be prepared to win quickly, with minimum casualties and limited external support, against any opponent. Our basis for success under these conditions is not equipment, but rather a maneuver style of warfare which gives our Marines the skills needed to deal with uncertainty and which provides the tools needed to shatter an enemy's cohesion through a series of rapid, violent, and unexpected actions. This philosophy of warfare is emphasized in all of our individual and unit training programs and exercises.

Our professional military education programs are designed to capitalize on our warfare philosophy and to provide the background knowledge and opportunity for innovative thought. In response to changes in our security environment our training and education programs focus on developing the skills needed to be successful on the most likely battlefields. Our emphasis is on teaching our Marines the skills needed to be able to perform as members of small independent action forces or as members of our larger MAGTFs. We have placed special emphasis on the development of the language and cultural skills needed to improve our Civil Affairs, Riverine Warfare, and Psychological Warfare capability within our active forces without increasing our manpower requirements. In an era of declining defense resources, our education programs provide a cost effective means of developing the operational concepts and doctrine needed for the best utilization of existing forces and for the development of new tactics, techniques, or equipment needed for success on the future battlefield.

Innovation in the development of operational concepts, doctrine, tactics, techniques, and equipment historically has been a strength of the Corps. Over two years ago, in anticipation of the changes in our security environment, the Corps refocused its efforts on our congressionally mandated role of providing the Nation an expeditionary force in readiness. We examined every aspect of our warfighting capability to ensure the best possible return on our Nation's investment. In response, we have taken steps to lighten the "lift footprint" of our active forces to ensure that they are deployable with existing strategic lift. Heavy equipment which was not suited for expeditionary operations, but needed for larger contingencies, was, and continues to be, transferred to the reserves. This approach ensures that our active forces are light enough to respond to the most likely conflicts or to respond initially to general war without mobilization. Our reserve forces have been structured to provide the augmentation and reinforcement needed to sustain operations during general war or a prolonged regional conflict.

In an era of decreasing access to overseas bases, it is imperative that we exploit fully the capability provided by our mobile sea based forces. Our force has been sized and organized to take full advantage of available strategic lift and prepositioning assets. Utilizing available amphibious shipping, strategic sealift and airlift, and Maritime Prepositioning Ships we are able to deploy expeditionary forces, appropriately sized for the mission, where needed, anywhere around the globe. In light of the changes occurring in our security environment, we must take a fresh look at the locations and timing of our naval deployments as well as the size and type of forces deployed.

If we are to meet the needs of the Nation, we must fully exploit the capabilities provided by our amphibious forces, Maritime Prepositioning Ships, and the flexibility provided by the air mobility of Marine Expeditionary forces in our service and joint planning. Already, improvements in force planning have allowed us to make significant improvements in our force closure times. By taking advantage of existing strategic lift assets, to include our Maritime Prepositioning Ships, we have developed a wide range of response options which permit us to provide the warfighting CINCs with a complete menu of sustainable force options to respond to crises across the spectrum of conflict. Additional improvements in closure time will be realized as we take increased advantage of the flexibility inherent within our existing force structure and lift assets.

In response to the increased lethality and sophistication of the anticipated threat, we continually are developing the operational concepts necessary for survival and success on the modern battlefield. Working in partnership with the Navy, we are improving our capability to project sustained combat power from the sea or land more rapidly over extended distances. By improving our capability to project power from over-the-horizon, we are able to maintain tactical surprise and bypass first line enemy defenses. Currently, this operational maneuver cannot be fully exploited by our existing forces. We are primarily limited by the range, avionics, and speed of our existing vertical assault aircraft. A new vertical assault aircraft is needed if we are to have the tools necessary for our Marines to go into harm's way without unnecessary risk.

Success on the battlefield requires that we continue to exploit affordable new technology. Our research and development efforts are focused on improving our existing expeditionary capabilities. We are actively pursuing the development of lighter artillery, armor, and ammunition. Other efforts are focused on improving our night fighting, command and control, and intelligence collection and processing capabilities. In this respect, particularly in view of fiscal restraints, it is vital that we, as a Nation, explore and exploit technology that has both civilian and military application.

Our ability to respond to the Nation's security needs is dependent on our ability to be where needed. We must have sufficient lift available to simultaneously maintain presence and respond to crisis. Modernization of our amphibious force is essential if we are to maintain our power projection capability. Although new ships continue to join our amphibious fleet, we are concerned that in the near future block obsolescence will limit our power projection capability at a time when it is most needed. Improvements also are needed in other strategic airlift and sealift programs. In these areas, we must not limit our efforts to strictly military programs. We believe significant improvements in our Nation's military sealift capability and civilian maritime industry also could be achieved by the development and operation of multi-mission capable ships. For example, by using common hull design and modular internal construction we could improve both our strategic and commercial sealift capability in a most cost effective way.

In response to the needs of our Nation, your Marines are responding today, virtually as we speak, to the types of crises we are likely to face in the foreseeable future. Your Marines' aggregate utility across the spectrum of violence will continue to provide our Nation with unmatched operational flexibility and

usefulness. Our training, educational, organizational, research and development, and operational focus continues to be on providing the Nation with the forces needed for short notice crisis response operations. Our strength is, and will remain: readiness, sustainability, and flexibility. Our spirit of innovation will continue to allow us to train and equip the forces needed to meet a significant part of our Nation's expeditionary force requirements. We are confident in our ability to provide the Nation with the highest possible return on its defense investment.

Senator KENNEDY. Thank you very much, General Gray, for your comments and for summarizing your view about the role of the Marines both today in terms of our national security, and on to the end of this century.

In the latter part of this book, you commented upon end strengths, and I think you gave a strong reason and justification for the numbers to which you just referred. There have been stories in the Washington Post and in other newspapers suggesting that in the next proposal there may be a reduction in the end strength by some 25 percent. I think the figures that were in the newspapers had it from 196,000 down to 159,000. If that were to be the case, what would be the implications in terms of meeting the kinds of goals that you have outlined and that have been included in your testimony?

General GRAY. Fundamentally, that would cause a serious impact on the capability of your Marines to provide the kind of forces that we believe Congress has in mind. Generally speaking, you are talking about taking a third of your operating capability out of your expeditionary forces. And so, if you go back to the global perspective and look at where these three expeditionary forces are located backed up by a very capable selective Marine Corps Reserve, one would have to ask the unified commanders in what third of the world do you want to have less presence, less capability, less flexibility, particularly, if there is more than one crisis at the same time.

These figures that have been mentioned have not been decided, to my knowledge. As the Senator well knows, the program objective memorandum 1992 process is very much being debated and discussed by the Secretary of Defense and the civilian and military leadership at this time. It is my understanding that none of these decisions have been made. And so, I think commenting may be premature. But I can say to you that below the 180,000 to 182,000 figure, we seriously disrupt the capability of your Corps to be organized, trained and equipped the way we are today. Above all, you are certainly going to take away responsiveness and aggregate usefulness.

Senator Kennedy. Let me direct your attention to the V-22. Obviously, that is going to be something that is going to be discussed and debated both in the committee, and probably on the floor. Certainly it has been debated in the Defense Department with Secretary Cheney. I would like to just get your responses to three or four different issues that I think the V-22 raises and to hear you out on them.

First, do you feel that we have gone to about the extent that we could go in terms of the modernization of modern helicopter capability today? Could you comment on that?

General Gray. I think from the standpoint of science, technology, and physics, that it is fair to say that you are at the upper limit of what you can do with helicopter technology. You can, indeed, get a little more power. You can build a more powerful engine. You can make adjustments with respect to the mission, the weight and the like. You can do things with the blades. There are certainly things that one can do, but fundamentally, we are at the upper limit. Therefore, you will not gain much more in the way of speed, and should you, you will trade off with other capabilities that are vitally needed when you use the helicopter platform in military operations.

Senator Kennedy. How do you evaluate the margin of difference in terms of survivability, in terms of speed and in terms of lift capability?

General Gray. I think all of that has to be viewed in a synergistic way. Speed and the ability to operate at night, the ability to have the defensive countermeasure systems, the avionics and associated weaponry are parts of the equation. I believe that speed is crucial to survivability. Speed and range are also crucial if you are going to be able to operate over great distances, achieve the element of surprise, and be able to operate inside the opponent's ability to act and move. All of these things are, I think, very important. It is the multiplier effect that comes from the synergism that is really the primary military advantage.

Senator Kennedy. Can you quantify the difference in capability from an amphibious point of view or other marine mission point of view that the V-22 sort of gives you?

General Gray. Yes. You, of course, can go twice as far and operate twice as long. You can carry much more when you begin to take into account the cycling of the aircraft and concept of operation. We certainly can give you a very detailed analysis for the record that lays that out very clearly.

Senator Kennedy. Well, I wish you would.

[The information follows:]

Some of the specific performance characteristics of the V-22 are as follows:

Speed: 275 knot cruise; 300 knot dash
Range: 300+ naut. mi. combat radius; 2,100 naut. mi. self-deployment
Cargo: 24 combat loaded troops; 10,000+ lb internal/external load
IR Signature: ¼ to ⅛ that of helicopters

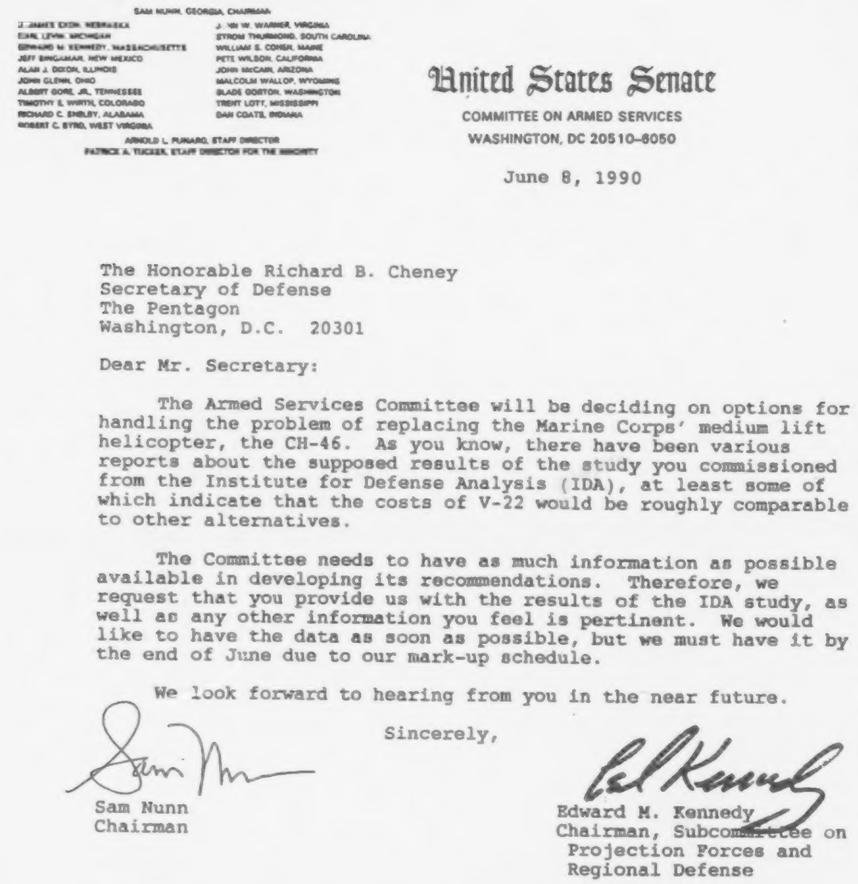
These performance characteristics are important, yet they do not tell the whole story. The V-22 incorporates a number of features that, when combined with its performance, make the aircraft a superior weapon system. Designed-in survivability comes immediately to mind. In addition to the reduced infrared signature and the speed to avoid threats, the aircraft is ballistically tolerant of small arms and many crew-served weapons; it incorporates system redundancy that precludes single failure modes; it has a crashworthy design that protects its occupants; and the aircraft floats if it is forced down over water. The design also incorporates integrated subsystems which allow for night and adverse weather operations with greatly reduced crew workload and increased operational safety.

One of the results of performance is productivity. This comes from a combination of speed and payload and permits quicker turnaround times, reduced ship cycle time, and more rapid buildup of combat power when and where it is needed. The ability of the V-22 to self-deploy should be considered here as well, since we will be able to free up strategic lift assets for other missions and subsequently increase productivity in that mission area.

Beyond these technical aspects of V-22 performance, I think it is important to consider one factor which is less tangible-growth potential. Helicopter technology has progressed to the point where little can be done to enhance performance or utility. Tiltrotor technology offers an opportunity to expand rotorcraft applications in the military *and* the civilian sectors. While we know a great deal about how we would tiltrotor technology today, its full potential will not be realized until we are well into tomorrow.

Senator KENNEDY. The third issue is the issue of cost. As I understand it, the root of Secretary Cheney's proposed cancellation was that the improved capabilities would not be worth the increased cost. And since that time, the Institute for Defense Analysis conducted a study of that issue, which Congress has not yet received. Yesterday, Senator Nunn and I wrote to Secretary Cheney requesting that the committee be provided with the study prior to our markup next month, and I will include the letter in the record.

[The information referred to follows:]



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United States Senate
COMMITTEE ON ARMED SERVICES
WASHINGTON, DC 20510-6050

June 8, 1990

The Honorable Richard B. Cheney
Secretary of Defense
The Pentagon
Washington, D.C. 20301

Dear Mr. Secretary:

The Armed Services Committee will be deciding on options for handling the problem of replacing the Marine Corps' medium lift helicopter, the CH-46. As you know, there have been various reports about the supposed results of the study you commissioned from the Institute for Defense Analysis (IDA), at least some of which indicate that the costs of V-22 would be roughly comparable to other alternatives.

The Committee needs to have as much information as possible available in developing its recommendations. Therefore, we request that you provide us with the results of the IDA study, as well as any other information you feel is pertinent. We would like to have the data as soon as possible, but we must have it by the end of June due to our mark-up schedule.

We look forward to hearing from you in the near future.

Sincerely,

Sam Nunn
Sam Nunn
Chairman

Ted Kennedy
Edward M. Kennedy
Chairman, Subcommittee on
Projection Forces and
Regional Defense

Senator KENNEDY. Are you familiar with the study?

General GRAY. Yes, I am well aware of the directive for the study and that the study has been carried out and is now in the Department of Defense. I have not been involved with the details of that study, nor would that be appropriate. We did have Marine membership with the working and study groups. We were permitted the opportunity to provide all of our thoughts with respect to the operational requirement and the need for this kind of capability. The study, as you know, is now in the Department of Defense, and we will have to wait and see what the next step is.

It is my understanding that our beliefs with respect to the cost effectiveness and capability were pretty well verified through the various scenarios. But, I would have to wait and see what the final product has to say.

I would like to add that the tiltrotor concept was conceived as a joint program, with all four services involved. There were many mission element requirements that the services initially signed up to. Over a period of time, some of the services pulled away from that program. It has since become known as a Marine program. That is unfortunate. It really, in my judgment, is a national program. It is a national capability.

Whether you use helicopters or advanced technology in the future is a decision that we must come to grips with. If the answer is to continue to use helicopter-type technology into the years 2020, 2030, and beyond, then we should get together and build the best kinds of helicopters and equipment inside these helicopters that we can provide for all defense and related needs.

If the answer, on the other hand, is to go with new technology, then clearly the tiltrotor idea is a splendid idea. It is a great concept. As I mentioned last year in the hearings, it was a hell of a time to have a new start with the expense that that incurs. Tiltrotor technology is a viable concept. It has great potential application well beyond your Marines. I personally believe that it would have applications in all the Armed Forces. With respect to the need for special operations, it is the answer to the infiltration-exfiltration requirement with which Senator Cohen is well familiar. It provides the kind of platform for long-range anti-submarine warfare capability. It certainly has potential for search and rescue. It could be an answer to the civilian commuter regional airport crisis that we face in many places around the country. Along with drug enforcement and the other needs, there is a wide range of potential applications. But again, I believe that it has to be made affordable.

Senator KENNEDY. Would you be any more precise in terms of what conclusions you drew from that report, in terms of the costs?

General GRAY. I am reluctant to do that without having had an opportunity to really analyze it and see how it fares at the next step. But it is my understanding that the cost effectiveness, to include the life cycle range and all of that, is very, very favorable to the V–22.

Senator KENNEDY. Well, we are hopeful of being able to get the report prior to the markup. As I indicated, I think it would be enormously valuable and helpful in responding to these questions and issues of cost, and I think it is really quite indispensible for an effective kind of an evaluation of the program itself. When we get that report, we may have additional questions on that issue of cost.

Let me ask you a question, General Gray. This is always a difficult question, and we do not always get an enormously valuable or helpful answer. When we see the kinds of budgetary constraints that the forces are going to be under (and as I mentioned at the outset, I think it would be a very serious mistake to have just these percentage cuts across the board; I think quite clearly the types of capabilities that you have and the special forces have only increased in terms of the kind of priority that we ought to have in the Armed Forces to protect our interests and our allies around the world), if you have to, can you give us any feeling, if that belt starts to get tighter, in your own view of the Marine Corps, how you might evaluate the more modern systems, the kinds of technology and research, and end strength? Can you give us some guidance about how we can be more effective in ensuring our security interests or protection, and also how we ought to evaluate the various priorities for the Marines?

General GRAY. In our case, our number one priority must be our force structure and readiness because we are manpower intensive. We must be so, in order to carry out our global responsibilities.

Therefore, the individual Marine and unit capability must be protected to do what must be done.

Within that construct, forces should continue to be selectively modernized: There must be a proper research and development program for the future. In our case, as both Senators well know, we have been very well modernized. We know what to do in lean years. We went through a very lean period not just after World War II and Korea, but from 1969 to 1980. These were very difficult times. And yet, we continued to look at systems, equipment and technology. We continued to study systems around the world. We did the bureaucratic paperwork, developed the mission area analysis and needs as well.

And as we used to say, we sent young sergeants and captains to meetings with the other services. We would tell them things like—go there and act like you have money. Tell them what the Marines need in that kind of weapons system, and then get out of there before they ask you to help pay for it. [Laughter.]

But the point I wanted to make is that we did our homework. And so, when we had the opportunity in the late 1970s to develop the maritime prepositioned force capability, and then when we had the decade of the 1980s, we were able to, as we say, strike like Genghis Khan. And so, we have modernized your Corps, as both of you know firsthand from your visit. We are coming from a good posture.

We would continue our efforts to ensure that we have a night fighting capability second to none. That must be high on the priority list. Capabilities to make the individual warrior, be he soldier or Marine, better, able to fight and to respond quickly are essential. These kinds of small dollar programs that add to the capability of these Marines are very, very important and high on our priority.

We need a replacement for our medium lift helicopter, as we well know. That of course is a discussion between helicopters or MV-22.

We also need to replace our assault amphibian vehicles at the end of the century. They too are near the end of their cycle, if you will. More importantly, they too are at the end of what you can do from the standpoint of physics and speed. You can get one or two more knots but, as the Senator well knows with his sailing experience, unless you get up on top of the water, you are not going to make a quantum jump in speed. Our new high speed amphibian vehicle is designed to do that.

We have built a demonstrator model of the vehicle. We have flown, if you will, up the Patuxent River. We have achieved speeds of 29 knots. We have turned it, which some of the engineers said we could not do. We are well on the way toward milestone one for a new high speed amphibian vehicle.

All of the general purpose forces, that is, your general purpose forces, I believe, must be capable of conducting a wide spectrum of special operations for all the right reasons, whatever one may use as a definition of special operations. That simply has to be the focus. We have that capability today. You have seen that capability. However, we believe we are limited now only by selected technology enhancements and practical application of technology. These are the kinds of things that I believe we must think about.

We support the airlift requirements because in order to respond rapidly, we must have combinations of airlift and sealift; the airlift sometimes for very quick movement, and certainly the sealift for sustainability.

With respect to sealift, I would hope that we would see continued interest in the development of new and more modern types of sealift, to bring technology to bear in that arena. I would hope that we would have multi-purpose, multi-capability platforms. I certainly believe that the next generation of amphibious ships, for example, should incorporate those kinds of concepts. However, that is the field, and properly so, of our Navy; but, Marine planners will do what they can to influence that kind of thought process.

I believe that there is a great use for this kind of technology, but I would argue that we should seek to use technology that has multiple use, both military and civilian. This is one of the potential advantages, for example, of the Osprey. This kind of an idea simply must be adopted over time if the systems and platforms are going to be affordable.

Senator KENNEDY. Thank you very much. Senator Cohen?

Senator COHEN. Thank you, Mr. Chairman.

General Gray, there is an old Latin expression. It is not the one the Marine Corps uses, but one I will use. It is "ver tuti non verbis." It means "deeds and not words." And I would like say that, since assuming the position of Commandant, you have demonstrated in deeds rather than words—or perhaps I should say deeds and words—what it means to occupy a position of leadership and to exercise it. I think you have done an extraordinary job in building morale within the Marine Corps, but in addition to morale, in building a capability, given the kind of limitations you have had upon funding that perhaps some of the other services have not had.

A member of my staff went down to New Orleans recently to watch a demonstration of the hostage rescue team down there, and came back singing praises of you and of Colonel Jones and others, using a whole string of superlatives. That demonstration made a very big impression on him, and it was passed on to me. So, I want to commend you for that. I would also point out—and I am not sure whether Secretary Cheney said this or not—that there is a report that he had either a press conference or a breakfast meeting with the Hearst Papers indicating the Marine Corps was poised off the coast of Liberia not only to rescue Americans, but also to rescue Soviet diplomats. If the Secretary said that, that truly does indicate there has been a remarkable change in the world.

But it also raises the issue of "what if it were the reverse?" What if it were the Soviet Union who had the global reach of the United States and it were we who had to call upon the Soviets to rescue our people? I think that might very well spell out some difference in terms of the perception. So, I think it is important that we do have that capability to project force, and of course, the Marine Corps is very much a part of that.

I would like to get your opinion. I was looking at your end strength chart here. Of course, with the exception of following World War II, there was a dramatic dip in terms of end strength, and then it ran back up during the Korean War and then again during the Vietnam War.

What is your assessment or best guess, I should say, in terms of whether the United States is likely to be committed to a long-term engagement or war or conflict such as Korea or Vietnam in the future?

General GRAY. I think that over the long haul, we have to plan for that kind of a capability.

Or to say that another way, if you make a major assumption that we will never be involved in a longer type conflict again, for any reason, then certainly we have to think about the risk of that. We have to look at the direct and indirect aspects of what that means in terms of credibility.

Or to say that another way, you certainly are going to increase the odds of someone wanting to do great damage to our country, if you have little or no capability to respond.

Or perhaps look at it in a different way. When we train sergeants, for example, to conduct planning and to run patrols, we try to tell them that whenever you make an assumption, you better have an alternative plan.

So, somewhere in our total force thought process is a number and a capability, if you will, which I think the leadership of our country must determine, so that we are never held hostage.

Senator COHEN. General, I agree with your general sentiments, and I do not want to take up time. We do not have enough time this morning to engage in a long colloquy about it. I would note that my own assessment is that it is unlikely, not impossible, but unlikely that we would commit troops for those long-term type of engagements given the reach not only of our power, but certainly that of television and what it has done in terms of the ability to carry out a long type of a conflict.

Second, the Soviet Union throughout this period of time has remained the major force that we have had to at least prepare to contend with. In the event that that should change—and it is too soon to say that has changed in any permanent way yet—it may call into question, or it may not call into question whether or not we will be able to maintain that size force. As Senator Kennedy has said, we would not like to see a Gramm-Rudman-Hollings across-the-board approach taken to the services.

By the same token, we would like perhaps not to see that approach taken within the Marine Corps, and if you are not at 197,000 or thereabouts, what would be the next step down? Would you take out a division? Suppose that you are given a requirement saying, "General Gray, you have to reduce manpower." What are you likely to do? Take a little bit from each unit, an across-the-board type of an approach, or take out a division? What would your likely reaction be?

General GRAY. What we would do is come down in structure, so that you totally avoid any possibility of a hollow force. We would come down in structure, and match the end strength to that. We would protect our air-ground logistics team under a common commander doctrine because we think this is the most useful of all of the arrangements. We would strongly recommend remaining naval in character because of the maritime aspects of what we do.

We would protect our training and our education infrastructure, at all costs, because we believe we must develop, and continue to develop, young leaders in the NCO and officer ranks that are, above all, trained and educated to deal with uncertainty; because, we think that is the kind of environment and crises that our people will be coping with.

And so, we would reduce further our fighting capability, our muscle. We would perhaps selectively spearhead a few more units in our selective Marine Corps Reserve, but there is not very much more we can do there either.

And, that is why when we took a look at our air-ground task force master plan at the year 2000, 3 years ago, and updated our structure and our plan, all of the ideas were there. In other words, what was occurring in the Soviet Union, etc. The only factor that we missed was the speed of the collapse of the Warsaw Pact. We were able to do that because we went back and looked at the 1986 CPSU meeting, and that kind of thing. I think the trends were there. We set, at the time we built it, a concept based on 190,000 men at the end of this century.

With the dramatic change and understanding and the fact that we are still going through a transitional phase, I would not like to see the Marine Corps go below the 180,000 to 182,000 figure at the end of the 5-year plan, nor in fact, at the end of this century. So, somewhere in the 180,000 to 182,000 figure is what, I believe, gives us the kind of capabilities we need. We would not like to come down more than 6,000 to 7,000 a year. Those numbers permit an orderly transition. It permits you to protect readiness and preparedness. It permits you to treat your people with dignity, and it permits you to come down in officers, senior NCOs, junior NCOs, and enlisted; rather than do it strictly through accessions and create problems downstream.

Senator COHEN. Could I just direct your attention toward naval gunfire support? It appears that we are going to see the deactivation of two battleships. One of the major reasons for *re*activating the four battleships was the need for naval gunfire support. I think Colonel Jones has indicated to me in years past how important those 16-inch guns were to him, as the Volkswagen-sized shells came sailing over his position in Vietnam.

There are some problems, obviously, with the battleships today in terms of the controversy surrounding the 16-inch guns. So, now, number one, what other types of gunfire would be important in your judgment? Number two, it comes down to a question of cost versus survivability. These battleships have Harpoons, have Tomahawks. That is also one of the reasons we reactivated them. They are perhaps the most survivable platforms we have, and yet they are very manpower intensive. It takes a lot of manpower to operate the battleship.

What is your assessment in terms of the tradeoff, number one, of survivability versus cost, and what would you use instead of the 16-inch guns for naval gunfire support?

General GRAY. Well, of course, the battleship, as we know it today with the flexibility and capability it brings that you have outlined, is really irreplaceable; that, coupled with its survivability. So, it is ironic in a way. It is a manpower intensive platform, but it is a platform that through its survivability is really made to order for the kinds of crises that we face in the future. When you look at what you could do, what we have already done and further exploited concepts such as adding helicopters and remotely piloted vehicles, it has enormous potential.

The current 16-inch ammunition would have to be improved upon, as we know. We have a plan to increase the range to 37 or 38 miles, which would be a significant enhancement. That, though, is still an interim goal. You really need to double that kind of range in the kind of environment that we face today. That is beyond the capability of the battleship and the upgraded ammunition of today.

This would then require a rocket type missile. As you know, we have supported the idea of the multiple launch rocket type warhead being adapted to some kind of naval platform. There has been a lot of thought given to that and some preliminary study. There has not been a program for that yet. I would hope that we would see that in the future.

I do not know of any other naval gunfire type programs that can give you the range that you would need. Eight inch and lower calibers are out of the question. There is not much more you can do with a 16-inch round even if you upgrade it. I think we have a void developing here, and one that certainly concerns all of us who come from the sea.

Senator COHEN. Thank you, Mr. Chairman.

Senator KENNEDY. Thank you very much. Senator Exon?

Senator EXON. Mr. Chairman, thank you very much. General, welcome here this morning.

This is a very, very important hearing. If we are talking about projection of forces, we cannot project forces without the Marines. Therefore, you play a very key role, and I want to add my name to those who have said the excellent things that they have said about your leadership of the Marine Corps which, as you know, is held in the very highest of esteem by this subcommittee and the committee as a whole.

Let me try, though, to get back to some of these things that we are going to have to be making decisions on with regard to the budget crunch.

We have listened to your comments on the V-22, and I accept your proposition that you want to see how this study proves out. That is a very expensive program, but I can imagine what the V-22 could do for mobility and for force projection for the Marines.

Senator COHEN. Did you say B-2 or V-22?

Senator EXON. V-22.

Senator COHEN. Okay.

Senator EXON. There is not unanimous agreement on the B-2.

General GRAY. Just let me have one of those. I'll fix that. [Laughter.]

Senator EXON. So far as I know, you have not requested any B-2s in the inventory of the Marine Corps.

General GRAY. No, sir.

Senator EXON. General, setting the V-22 aside, could you help us some by saying in your opinion, as we look to markup under the conditions that face us today, what the three top procurement programs are in your view? Now, that does not mean that there are not others that you think are tremendously important, but trying to prioritize a little bit, if we can, would you be comfortable in citing what you think are the three most important procurement programs?

General GRAY. For the Department of Defense or for the Navy?

Senator EXON. For the Marine Corps.

General GRAY. Just the Marine Corps, and of course, as a part of the Navy.

Well, blue-green, or Navy-wise, in the aviation area, it would have to be procurement of a replacement for our medium lift requirement to come from the sea and whether that is a new upgraded helicopter family. If it is that, it must not be a vanilla helicopter. By that I mean it must have the avionics and the defensive systems in it, or, I cannot support sending Marines to battle in anything less. If it is advanced technology, then we know what we would like to see here.

We certainly must continue any procurement that has to do with command, control, communications and intelligence; the so-called C3I effort. This is essential for continued interoperability. It is essential if we are going to have the kind of surveillance, intelligence and information we need in the future. And, I would add that the lower the intensity of conflict, the more difficult it is to get the kind of hands-on combat information and intelligence one needs to make the decisions to be successful.

The third priority, I would split between the need for continued improvement in strategic lift, both the airlift of the type that soldiers and Marines would be benefit from in the C-17 idea and the continued efforts to improve our aggregate sealift posture; recognizing that is a national program and recognizing that there are many, many complicated factors therein. But, we must continue, I think, for the good of the country, to seek a better sealift type position.

These are the primary areas that I am concerned about from my vantage point. There are many other smaller programs that I insist upon.

Senator EXON. I covered those in my question.

General GRAY. Yes.

Senator EXON. A little bit of a follow-up on communications and intelligence—what positive and what negative did you learn, that you can talk about in this open classification, as a result of the Panama operation? When you said low intensity, high intensity conflicts, would you place the Panama operation as low intensity or high intensity, and what can you tell us about what good, bad or needed improvement that we have learned from that operation?

General GRAY. Well, I would certainly categorize that at the lower end of the spectrum; and, with some exceptions, not too hostile an environment; although, again there is no such thing as low intensity violence.

From our vantage point, our posture and our thoughts on what was needed for good intelligence, in support of Marine forces, worked quite well. We have a considerable all-source tactical intelligence capability made up of counterintelligence, reconnaissance personnel, signals intelligence personnel, and related types of disciplines. And we had been there for a long time. Our task force was there for a couple of years. So there were really no surprises for us in this arena. Our people have become very adept at exploiting information from national means. We also had topographic expertise there.

From the larger standpoint, I think that, whether it is a lesson or not, we must understand that it is never going to be perfect. There are always going to be uncertainties. You are never going to have a foolproof setup where nothing can go wrong. Again, intelligence is very hard to come by. You are going to have to rely on other nationalities and other people more. There is a huge human intelligence factor in this overall equation. I think that we certainly had ample information on the situation. Whether it was all that certain commanders would liked to have seen, or not, is another question.

My own view is that in order to use intelligence, you must know how to get it, and where it comes from. You must have an integrated relationship with the intelligence community. You have to work at it, and you have to make an investment. That is why we have many young Marines in all of these agencies today.

Senator **Exon**. Just a follow-up now so I can help get some clarification on this: You are thoroughly familiar with the grave difficulties that we had with basic communications or lack of ability from one branch of the service to talk to the other in certain places where we had a recent projection of forces operation on small islands in the Caribbean. Compare that, if you will, with how the Panama operations played out.

We have all agreed up front that it was not very well handled in some of those previous actions against islands in the Caribbean. Learning from that experience, did we do a much better job in Panama, but have to go even further trying to put it in the context of a comparable scheme of things?

General **Gray**. I think that the communications in the C3 aspects of Panama were about as good as they can be, given physics and the human part of the equation. There is good reason for that. Had there not been, certainly we would have had much to answer for. We had ample time to plan for that. We had, in effect, the national joint communication system put in into Panama. And so, there simply was no reason not to have the kind of communications that were necessary for this type of special situation where we had a large force already down there.

I think it is a bit unfair to compare or to draw too many lessons from the communication environment of Panama and the one of Grenada. I would like permission to answer that in detail, for the record. I have somewhat of an opposite point of view of the one adopted by many; to include distinguished members of this committee on Grenada. Sure, communications could have been better. They can always be made better.

I think the real root cause of the situation in Grenada was that there were people who really did not know joint communication doctrine. They did not really know what had to be done in that kind of an arena; and, certainly were not prepared for the communication environment that Grenada presented to them. That is another way of saying that I think that it could have been much better.

I realize there is no need for me to say that; and, that I am certainly going to pick up some enemies along the trail. But really, you are not going to communicate very well when you have got the wrong frequencies, the wrong call signs and the wrong SOP for the wrong part of the world.

[The information follows:]

CMX'S COMPARISON OF OPERATIONS IN GRENADA AND PANAMA

The military operations in Panama and Grenada should not be compared. Just Cause was deliberately planned and trained. Existing U.S. Government communications infrastructure was significantly enhanced during the months preceding Just Cause in the event that it would be necessary to support military options. Forces in place formed the nucleus of combat forces, and CINCSOUTH and his subordinate Headquarters effected close, continuous coordination with those forces and potential reinforcements.

I take exception with the conventional wisdom that communications was fouled up during Urgent Fury. Grenada was a spontaneous, truly expeditionary contingency operation for which planning and execution was compressed into a few days. The tactical forces provided their own communications systems from scratch. There was no existing infrastructure, the apocryphal ITT credit call card for fire not withstanding. Communications systems were installed according to doctrine beginning with single channel radios and expanding to sophisticated satellite systems.

The tactical forces at the battalion and squadron level executed their missions with minimum confusion and minimum communications problems. What problems were encountered, and there are always communications problems to be encountered in combat, were quickly overcome by the experienced Marine and Army commanders at the battalion and squadron level. There were some fielding mismatches which required work-arounds. For example, the Marine Corps had not yet begun, for fiscal reasons, equipping its helicopters with new crypto devices, while the Army had already completed the process. The Army Ranger Battalion Commander and the Commander of the Marine Helicopter Squadron worked out a solution on the spot and conducted a truly joint mission with Marines in helicopters to rescue the university medical students.

Other fielding and equipage problems made communications with higher headquarters difficult but their impact on mission accomplishment was negligible. If anything, this kept the demand for information down to a manageable level. The tactical commanders weren't burdened with unreasonable demands for information.

Urgent Fury was, it must be remembered, a military success. All of our objectives were met, American lives and property protected, all at a minimum of collateral damage to Grenada.

Senator EXON. My time is up.

I really appreciate you being up front with us on this, General. I guess it is safe to say then that at least what I am getting from your testimony is that we have a way to go yet, and Barbados and Grenada were significantly different from Panama given our force structure there, and it is hard to compare one with the other.

General GRAY. I think we have made enormous strides in the past several years, both before Grenada and after, to give you the kind of C3I that you want. I think we have a way to go. The SINCGARS program and some of those programs are important to that end, but, I think, unequivocally, that your forces are better prepared to operate in the joint and combined arena today than at any time in our history.

Senator EXON. Thank you, General. Thank you, Mr. Chairman.

Senator KENNEDY. Since Senator Exon mentioned intelligence gathering, I will say that one of the impressive aspects of my visit to the gulf was talking to your intelligence officers there. They told me that they used to go down to the mosques and listen to the sermons, and following that over a period of time, began to get a better feeling and a sense about what was happening in terms of at least one group of the population that, obviously, was enormously important and influential. I thought that was enormously resourceful.

Senator Coats?

Senator COATS. Thank you, Mr. Chairman.

General Gray, I know you have already talked about the V-22. I think the fact that so many of us have questions and interest in it indicates both the level of interest and the level of concern by members of this committee and other Members of Congress about where we are going in the future to meet your needs, and you have listed this as your number one priority. I wonder if I could just follow up with a couple of questions, some of which you partially already addressed.

I gather from your testimony, your written statement, and your responses to questions here this morning, that there is no equivocation in terms of your interest in this type of lift system to meet the needs of the Marines in the future. We are simply dealing with budgetary realities and problems relative to whether or not you can go forward and procure that particular instrument.

General GRAY. Yes. I think that the concept, as it was conceived to be a joint program, is a very exciting concept, one that we should try to obtain. But, it has been an affordability issue. It was not a good time to have a new start. It had the appearances of a narrow mission because other services pulled out of the program. Different people have different views of the kind of capabilities that are needed in the future. So, it has been mainly an affordability issue.

My own view is that the key to the platform of the future is the avionics package and associated systems. That is a must, whether you have rotary or tiltrotor. And if you want to gain the additional advantage of speed, range, survivability, and the ability to operate at great ranges, then clearly a tiltrotor has advantages. But I believe we will only get this national capability if we do it in such a way that we drive down the cost while the multiple military and civilian uses of this capability come forth.

Senator COATS. Well, in light of that response, I want to make sure we are not leaving the impression that simply upgrading avionics on existing medium lift capability, the CH-53 or the CH-46, would be an acceptable substitute. I do not think that is what you are saying, is it?

General GRAY. No, absolutely not. What I am saying is that if you do not get advanced technology and you go back to a helicopter regime, then it must have the avionics and the defensive systems. It will not have the capability of advanced technology, but it must have that. That alone is going to make it, I think, extremely costly to have a helicopter replacement. So, I think you have to compare that kind of a capability with the cost requirements of tiltrotor technology. Then when you compare that and include the operational advantage, then and only then, do I believe you can make the right kind of choice.

Senator COATS. My understanding is that the Navy and Marine Corps recently completed a review of the integrated amphibious operations and marine air support requirements, and that one of the conclusions is pretty much along the line of what you said. I just want to confirm that, that the CH-53 is too heavy and the CH-46 is too light in order to meet those requirements that you have specified.

General **Gray**. The CH-53E is not a competitor for the assault lift requirement. It never was and it never should be. It is a logistics helicopter. It is a huge helicopter to carry much needed supplies and equipment at great ranges ashore. Yes, you can carry people in that helicopter. We did it when we came out of Saigon and in other kinds of evacuations, but the CH-53 family is a logistics helicopter. It does not have the tactical capability one would want for assault helicopter or assault rotor operations. It also has a huge infrared signature. It is apples and oranges, if I may use that expression.

The CH-46E or follow-on to that, as an alternative, is in our view, far better than something like a Blackhawk. We cannot carry enough people in a Blackhawk to do what must be done. We would not have the adequate numbers of machines, pilots and crewmen. So, it is not a feasible choice for us.

For us, the issue for the medium lift requirement is to build a new modern helicopter which would look very similar to the CH-46 of today, which would have the avionics and other upgrades. But basically, this would not give us much in the way of an improved capability because again, we are at that outer envelope of technology.

And it will not permit you to come from well over the horizon which we believe we must be able to do in any forcible entry requirement. Bear in mind now, we really are the Nation's forcible entry component. This is very important. If you are going to conduct a forcible entry against a determined foe or anyone with some of today's weapons, there are three letters that drive you over the horizon, PGM, precision guided munitions. There are munitions out there in the hands of others that will blow ships out of the water if you come too close, too soon. And so, that is the genesis of the over the horizon concept, in theory. We come from near over the horizon now, but then we have to close very, very quickly; quicker than we would like.

To use another kind of an example of operational requirements, when we came out of the Mediterranean we were concerned with the timing to position the forces off of Liberia. It was a little bit tense as we came out of Rota. We looked at the tactical situation; so much so, that we took the Marine maritime special purpose force, the specially trained commandos that Senator Kennedy alluded to, and some helicopters and intelligence people, and we put them on a destroyer, sprinting them ahead at 29 knots. It would have been nice to have the MV-22 capability because we could have not only executed from the vicinity of Rota, but we probably could have done it in 7 or 8 hours.

So, these are the kinds of operational advantages that catch Marines' attention. Now, to be perfectly honest, it is always difficult to weigh these kinds of things. You either have a capability or you do not. And we have to base our forces on what is in the hands of our warriors today. That is the kind of flexibility that we seek.

Senator **Coats**. I assume that even if you had the authority to move numbers around within your existing budget, it would be possible to shift your dollars and priorities in such a way to add the V-22.

General **Gray**. It is always difficult for me to talk about shifting dollars around because, as you well know, we do not even show up in the pie charts in terms of allocation. [Laughter.]

We deal more in the round-off part of the spectrum.

But within that construct, of course, our aircraft and the parts are purchased by the Navy; and therefore, we are talking about a Department of the Navy recommendation to go up to the Department of Defense. And so, it is impossible for the Commandant to speak authoritatively on that. We always try to maintain a balance here.

But we have planned for procurement of a medium lift requirement system; and therefore, funding is in the plan to meet that requirement whether it is another helicopter or tiltrotor technology. Also if we were to get that capability, we could make adjustments to our CH-53E requirement. So, it is fair to say that we, the Marines, could make a recommendation which would make sense to us, but we would have to balance that out within the overall Navy requirements, as they are determined, and then again, within the Department of Defense arena.

Senator **Coats**. This is my last comment, not a question. In that regard, we are anxiously awaiting the COEA report. Anything you can do to get that before this committee, obviously, would help us in making those kinds of decisions.

General **Gray**. I understand that the committee has sent a request for that, and so I would assume that it——

Senator **Coats**. We may be sending an armed guard to retrieve it if we cannot get it soon, because it would be very nice to have that before we make 1991 defense authorization decisions. So, I am sure anything you can do to help us would be appreciated.

General **Gray**. You can be assured of my tacit support on anything that we believe is good for the country. [Laughter.]

Senator **Coats**. Thank you.

Senator **Kennedy**. Thank you.

General, I have just three areas I would like to get your comment on. The first is the sealift R&D. This has been an area many of us have been interested in for some period of time, the reduction in our sealift capability. We have seen changed world conditions. Maybe the research that might have been advisable a few years ago ought to be different today, but we have seen the Department of Defense serve that money up for reprogramming, not just once, but several times.

You mention in your testimony, page 14, that "it is vital that we, as a Nation, explore and exploit technology that has both civilian and military application."

Is the sealift R&D research—the sealift R&D program—important in terms of the design of future amphibious ships as well?

General **Gray**. In my own view, yes, Senator. I believe that there is a natural congruence that comes from the study of advanced forms of sealift and the requirements to come from the sea with respect to an amphibious assault. Things like common hulls, common technology and that type of thing, I think, offer promise.

This whole issue of sealift is always a very difficult topic, as the Senator is well aware. How much is enough? Where should we be going and the like?

I would like to think in the next generation of assault from the sea type capability, we would look for as much common technology and aggregate usefulness, for a variety of means, as we possibly could. Again, as I said earlier, I think new technology has a great deal more chance of being fielded if it has multiple use. So, yes, I am a supporter of anything that looks "downstream"; that takes us out in the future; and, that provides for the potential for aggregate usefulness.

Senator **Kennedy**. Talking about downstream, I understand—and correct me if I am wrong—that the Department of the Navy has decided to adjust the goal for amphibious lift shipping downward from the one Marine expeditionary force plus one MEB. The newspapers have reported that procurement for the LHD-1 class ships have been eliminated in the out-year program. Would the elimination of the remaining LHDs be consistent with supporting the new lift goal?

General **Gray**. No, we do not think so. And, of course, that determination really has not been made yet. That is part of the POM deliberations that are going now. We believe that LHD-6 and LHD-7 are required; and we support that position.

The analysis is with respect to the lift for three Marine expeditionary brigades, assault echelons. This would give you the capability to move a large task force, of Marine brigade size, plus residual amphibious lift capability for additional assault or reinforcement in each ocean. Of course, these kinds of assessments become dollar driven. It is an affordability issue. The operational requirement, in my judgment, has long been to be able to lift a MEF in each ocean. We cannot get to that kind of a requirement. That is one of the reasons why Defense and the Congress sponsored the maritime prepositioned force capability. In essence, today you have the amphibious lift and the maritime prepositioned ship lift. When augmented by the airlift that is available, you can move these forces with global reach in all of the oceans.

So, the lift requirement is less than your Marines would like to see. It is an affordability type issue. The LHDs that we have requested and planned for are needed. The new LX, not to be confused with a helicopter requirement of another service, I think, is both very exciting and one that we should pay close attention to. This would be a multi-purpose amphibious ship of the future. This would be configured more for aggregate usefulness in the kinds of conflicts that we foresee. We would hope that in the 1995-1996 time frame, such a platform would be funded.

Senator **Kennedy**. One of the major adjustments that Secretary Cheney proposed in the 1991 budget was the cancellation of all M-1 tank production. Of course, the Marine Corps was also participating in that procurement in order to replace its tank, the M-60. As I recall, the Marine Corps was a somewhat reluctant partner in the program. Nevertheless, Secretary Cheney's termination will leave the Marine Corps owning 215 M-1 tanks when the original plan was to buy a total of 476.

Could you tell us how you are planning to make do with fewer tanks than were earlier in the plan?

General GRAY. Of course, we continue to need a main battle tank, not very many, but a capability. We need that because of the mid-intensity type requirements that we have planned for. And as you know, many of these regions have a considerable armor capability.

A part of the concept behind the maritime prepositioned forces was to have three tank battalions: three light tank battalions: not light in terms of weight, but 53 tanks, in each of the MPS. This was to be able to get some armor ashore, and in use, very quickly. We have a total force capability today with our M-60s, of five tank battalions; three in the active structure and two in the reserves.

What we would do with the lesser number of tanks would be to create two tank battalions, one on the east coast and one on the west coast, with each expeditionary force. Each of those would be active; but, they would be spearheaded by some reserve tank capability. That would permit us to have the capability to have forces that could use the new M-1A1 tanks that would be put on the maritime prepositioned ships.

My own view is that the main battle tank of the future is one that should be considered for development and that is the light tank. We have prepared concept papers and taken developmental action to achieve this. We believe that there are far too many places around the world where we are liable to have to go, where the larger tank of today simply is not the answer.

Now, you always pay a price when you talk about these things in terms of survivability, vulnerability, fire power, et cetera. But, that is certainly the concept that we have. We had that concept in the late 1970s. We brought that idea a long way, but we were never able to bring it through completion, development and procurement. So we have retabled this initiative again.

Senator KENNEDY. Thank you very much. Senator Cohen?

Senator COHEN. Just as the LX should not be confused with the LHX, we should not confuse the need for a light tank with the LAV, which occupied a considerable amount of controversy during the 1980s as to who was going to have the principal responsibility for the development of the LAV.

General, could I ask you about the Mark 19? Apparently the Army has cut back that weapon system substantially from its buy. What is its utility from the Marine Corps' point of view?

General GRAY. The Mark 19 automatic grenade launcher or machine gun, which as the Senator knows, fires a 40 millimeter round with machine gun type rapidity, is a very, very versatile weapon. It was first used in the Riverine forces in South Vietnam. That was the Mark 1. In 1979, although again we had no money, we remembered that. We brought it to Quantico. We test fired it for all the services. We liked it. Other services "marked time," which is not unusual for them. [Laughter.]

We went ahead and had industry come up with a Mark 3 version that had fewer moving parts and was more rugged. When we were provided a little bit of money in the early 1980s, we went ahead and fielded it.

It is a great weapon for reconnaissance units and for screening units. It is a great weapon system in built-up areas. It is superb in the so-called rear areas, although there are no rear areas in low intensity type conflict. It has a multiple application. We have it on our combat jeeps; on our high mobility, multi-purpose vehicles. We have them on our assault amphibian vehicles. We have them on our light armored vehicles. We have them in a wide variety of configurations, to include our light infantry type brigade units. We think it really does a number on enemy mortar positions, concentrations, etc. It is like being under a mortar barrage of 100 rounds a minute. It is superb against light armor. It can defeat all light armor that we know around the world today. It has a lot of application. If it didn't, of course, the Marines would not have it. So, we are very high on this system.

I do not know why the Army did this. I suspect affordability.

Senator COHEN. Could you give me your assessment in terms of the desirability of the MLRS versus the Army's ATACMS?

When you talk about the need to have an over-the-horizon capability, you are not going to send the V–22 or anything else in there unless you have suppressed the air defenses. That is going to take a longer and longer range, and I would like your assessment of what will give you the most capability in terms of the MLRS versus the ATACMS.

General GRAY. Well, I think we have to look at both of these. I think the MLRS, in its present configuration is simply too big for your landing forces. I personally have always been of the view that we should take the rocket, the basic pallets of rockets, and figure out a better way to have a smaller pallet, fewer rockets, and fire that capability with a much lighter expeditionary kind of system. That would be my thought.

In other words, I believe you can take the multiple launched rocket system idea, to include the warheads and any future technology associated with it, and develop better kinds of delivery systems that would be lighter, more useful and have the range and flexibility you need.

And so, I would hope that we would do something like that. We alluded earlier to the fact that there has been considerable thought and a study to do that with a shipboard kind of a capability.

Senator COHEN. My understanding is they could outfit ships with the capability of the ATACMS, which gives you a much greater range than perhaps the MLRS.

General GRAY. I think the ATACMS has enormous potential there. And I think what we need is an R&D program to get the answers to the kind of suggestions you are making here.

Senator COHEN. As I understand it, the A–6 has been transferred out of the Marine Corps to the Navy, and you in turn have been given the F/A–18. The air to ground radar guided capability is not as great in that aircraft. What is the status of the upgrade?

General GRAY. The F/A–18 upgrades that we seek are on target, as far as I know. We certainly need that capability because that goes a long way toward meeting the all-weather deficiency that would be caused by the transfer of the A–6E. I am not aware of that program being anything other than on schedule. I think that we are on track here. Certainly, it is part of the overall package to ensure that we have the radar upgrade, the two-seat version, etc. That will be a very fine capability for us.

Senator COHEN. General, you have circulated a list of recommended books for reading, and I notice there are some major deficiencies. I did not see any of mine on that list, but aside from that, what kind of success have you had with this recommended list of yours?

General GRAY. We think it has been very, very successful. We really did not expect to get all the publicity out of it that we did. I was really taken aback by the interest.

But the idea is to get our people, young and old alike, to continue to read and think about their profession and about things that are related to their profession.

I have been criticized by some for not having a reporting system. They ask, well, how do you know whether they are reading or not? Of course, when people ask me this, they really do not know Marines. When the Commandant asks Marines to do something, they will try to do it. That is all we need to do here.

The goal again is to capture their thinking a little bit, with the idea that they can learn and develop professionally. You cannot, in my view, be in any profession, successfully, if you do not dedicate yourself to a lifelong idea of learning.

I have had numerous reports from my field commanders, one here only the day before yesterday. General Milligan reported to me that we would be delighted with the reading program that is in Diego-Garcia. He has been out there visiting these young warriors. So, we think it is working very well. Some people laugh and say, well, we only have to read two books. They are missing the whole point. Aside from manuals and the like, the idea is to capture them here and see just how much better they can make themselves and their units by doing this.

The only ones that I really am concerned about are the generals. And I will put your book on their list. [Laughter.]

They are the only ones we do monitor. We play war games together and battle simulations every 3 to 4 months, and that is when the Commandant finds out whether the generals are reading the books. But, everybody else is doing pretty well. [Laughter.]

Senator COHEN. Is Sun Tsu on that reading list of yours?

General GRAY. Oh, yes, absolutely. Absolutely.

Senator KENNEDY. Thank you very much, General. I think all of us are very mindful about the service of the Marines, but I think those of us who follow it with the greatest interest are mindful that even though there is not perhaps a shooting war today, that these young men and women are risking their lives. We have seen a young Marine who was on temporary duty in the early part of May, John Ferdette, who was killed in the Philippines, and they are still investigating the circumstances upon that tragic death.

General GRAY. I think we got them.

Senator KENNEDY. Well, that is certainly good news.

We are mindful of the losses which have taken place or the helicopter crashes in the past few years and other accidents which take place. I think all of us continue to admire the extraordinary courage, the dedication, and the commitment that these Marines have in terms of the security of our Nation. And as far as I am concerned, those who lose their lives at a time when we are not involved in a major conflict are just as much heroes as those who lose their lives in the time of a real fire fight.

So, we welcome you back to the committee.

We note we are joined by Senator McCain. We would be glad if he had some——

Senator COHEN. Closing remarks.

Senator KENNEDY [continuing]. Closing remarks. [Laughter.]

Senator MCCAIN. I apologize for being late, Mr. Chairman. I was over at the Inter-American Defense College giving a speech for graduation. I do not have to tell the Chairman how important it is for those military officers of Latin American countries to have our views as to the importance of the respect for human rights and democratic institutions as many of them emerge as leaders in their countries.

Mr. Chairman, I will not take very long. I appreciate your time.

General Gray, there are a lot of tradeoffs that have to be made. I know that you have been thoroughly grilled this morning. I continue to be disappointed to some degree in our inability to shape a strategy, as opposed to what apparently are proportional cuts being inflicted on the services. I hope that we can do a little better on defining our roles and missions—for example, the Marine Corps in the Pacific area and the role that the Army plays in the Atlantic area and in the Middle East. As we make these reductions, I think we have to more clearly define the roles and missions of the services, keeping in mind, as the Chairman was just describing, that it seems to be the Marine Corps that is usually there first, or called upon to provide presence or even involvement in case of crises in most places in the world. The latest example, of course, is Liberia, where our Marine amphibious forces were clearly present. Hopefully, they will not have to be used.

I think, General Gray, that I am preaching to the choir when I tell you that if we reduce all those capabilities of power projection over which the Marine Corps is a background, we may be placing in jeopardy our capabilities to address Liberian, Libyan, Panamanian and other problems that seem to arise all too frequently in this era of unprecedented peace and the end of the cold war.

So, Mr. Chairman, I again apologize for being late. I have the highest respect and regard for the views of General Gray. I think he is perhaps one of the most credible individuals that I have had the privilege of working with.

And, General Gray, I know you are doing a lot of serious in-fighting right now. We need to have your views and that of the other service Chiefs pretty soon. Otherwise, it is clear to me that many of these decisions will be made here, and not in the kind of partnership relationship that I think is necessary if we are going to truly arrive at the best kinds of decisions, and not have them being just driven by budget cuts. That is, frankly, my greatest fear to date. I do not know if you share that view or not. Do you?

General GRAY. Yes. I think we are all concerned that the budget decisions, hopefully, will be made in such a way that they are weighted towards the kind of forces and capabilities that present the most usefulness in the future; notwithstanding a certain capability as we all know that is needed for strategic deterrence and the like.

And so, I believe that again we are in the maritime environment. We have a maritime nation with a dependence on maritime capabilities and superiority. Those who talk about Marines versus Army, elsewhere, really do not understand the maritime character of their Marines. They do not understand that we come from the sea. Anybody can go across the sea and then do something on the other end. But when you come from the sea as an operational system integrated with surface action groups, and all of that kind of capability, that is the added dimension.

We believe that we must have sea basing. We believe that we must learn to live with less in the way of forward-basing and base rights. So, all the rationale and raison d'etre for the kind of capability that exists today I think is even more justifiable for the future. We are not looking for new roles and missions. We have a very big plate today in your Corps of Marines; plus that always interesting phrase "such other operations as the President may direct".

From our vantage point, the capability is there. We believe it is what the Congress intended it to be. We have strived to make it, indeed, second to none. We believe that we are fully prepared for the rest of this century and beyond. We also believe that as the Nation would expect, we are the best bargain in town.

Senator **McCain**. I am oftentimes reminded, Mr. Chairman, of the words of Harry Truman, who said that the Marine Corps has the best lobby in Washington. Most things change; some things do not.

Thank you very much, Mr. Chairman, for your indulgence. Thank you, General.

Senator **Kennedy**. General, thank you very much for a very helpful and enjoyable hearing.

General **Gray**. Thank you, Mr. Chairman.

Senator **Kennedy**. The committee stands in recess.

[Questions for the record with answers supplied follow:]

Questions Submitted by Senator Sam Nunn

MARINE CORPS RESERVE SUPPORT ACTIVITIES

Senator **Nunn**. General Gray, in its report on the Fiscal Year 1990/1991 Defense Authorization Act last year, the committee directed the Marine Corps to take appropriate action to ensure 100 percent manning of authorized positions at the Marine Corps Reserve support activities at Kansas City. The committee also directed the Marine Corps to conduct a manpower requirements audit of these activities. The committee took this action because it became aware of inadequate administrative support of Marine Corps Reserve personnel requirements, such as timely issuance of orders and the timely issuance of pay and travel reimbursements.

What actions did you take to ensure that the committee's directions were carried out and what is the current state of manning at the Marine Corps Reserve support activities in Kansas City?

General **Gray**. Since the issuance of the committee's report, the Marine Corps completed a comprehensive study of the Reserve Support Activities in Kansas City. We reviewed policies, procedures, and manpower requirements. We reached the conclusion that our policies need to be updated and our procedures can be streamlined. With these changes the present staffing levels will be sufficient.

I am pleased to report we have begun taking the actions necessary to improve the Reserve Support Activities in Kansas City. Marines are already seeing reduced processing time required to settle travel claims. By July, the turnaround time for settling travel claims will be reduced some more when an automated system will become operational.

Senator NUNN. Are you satisfied that Marine Corps Reserve support activities, which are crucial to the operational effectiveness of the Marine Corps Reserve, are being carried out efficiently?

General GRAY. I am satisfied that our Reserve Support Activities are operating efficiently and that they will continue to make improvements in the services they provide our Active duty and Reserve Marines.

Senator NUNN. General Gray, in the Report accompanying the National Defense Authorization Act for Fiscal Year 1990, the conferees directed the Department of the Navy and the Marine Corps to initiate a program to correct safety, health, and morale deficiencies in the facilities at the Marine Corps Mountain Warfare Training School at Bridgeport, California.

Specifically, the conferees directed that:

The Department allocate during fiscal year 1990, $2.3M in minor construction or operations and maintenance funds for immediate repairs;

Earmarked for Bridgeport 33 units of new military family housing from the 412 units authorized for Camp Pendleton in fiscal year 1990;

Authorized $8M in fiscal year 1991 military construction for austere facilities for Bridgeport.

Could you update the committee on the Corps progress in meeting this guidance?

General GRAY. The following projects address the appropriate repairs and improvements funded by not more than $2.3 million minor construction and repair and maintenance authorization, to the MCMWTC complex as directed. Due to the recent decline in O&M funding, only a portion of the required work can be accomplished in the current fiscal year. Contracts for the work shown below will be let in the fiscal year indicated, funds permitting.

PROJECT #	TITLE	COST	FY	FUNDING
PE-130MS	*REPAIR ROADS & PAVEMENT	844K	91	REPAIR
PE-218R	*CONSTRUCT PARKING LOT & ROAD	180K	92	MINOR CONSTR
PE-220R	*EXPAND COMMUNICATION AREA	195K	92	MINOR CONSTR
P-797	**TROOP BILLETING AND SUPPORT	370K	94	MILCON ($8M)
P-539	**EQUIP MAINT BLDG ADDITION	700K	94	MILCON ($.7M)
	TOTAL	2.29M		

Note: * These projects have been authorized for design and will compete with other valid projects for program funding in the fiscal years indicated.

** This MILCON project includes scope that was initially determined to be minor construction but is more appropriately included within the scope of this MILCON project.

Thirty-three, fiscal year 1990, Camp Pendleton housing units will be sited at Bridgeport, 3 at the Center and 30 at the Coleville Housing Area. The MILCON moratorium will delay contract award until November 15, 1990, at the earliest.

As noted in previous statements, the Marine Corps military construction funding has declined significantly both in fiscal year 1990 and fiscal year 1991. The tempo of Marine Corps operations has changed little in light of this reduced funding. Therefore, the paucity of funds and other pressing operational requirements precluded the inclusion of the subject $8 million military construction project in our amended fiscal year 1991 budget request.

Senator NUNN. When will construction begin on the fiscal year 1990 improvements?

General GRAY. While awaiting the completion of the $8M MILCON project, P-797, to provide essential troop billeting and support facilities, we will address the need for adequate heads, showers, and laundry with interim relocatable trailers. Site preparation for these structures has already been completed. They are contracted to be in place and operational by July 20, 1990. All other previously mentioned work will be executed in fiscal year 1991 or after due to funding constraints.

Senator NUNN. I note that the revised budget request before Congress does not include the project for Bridgeport which the Congress authorized for fiscal year 1991 in last year's 2-year authorization. What Marine Corps project in the budget request would you recommend for deletion in order to fund the Bridgeport initiative?

General **Gray**. As previously noted, the Marine Corps military construction budget is very constrained while existing operational requirements remain relatively unchanged. While we recognize the need, we have no room to provide offsets from our fiscal year 1991 military construction request to fund austere support facilities at Bridgeport. We plan to address this requirement in our fiscal year 1994 military construction budget request. It should be noted that the Marine Corps has invested more than $32 million in the MCMWTC since the Master Plan was approved in 1982. While we are pleased with the results thus far, we are aware of the improvements that still need to be addressed. In an environment of increasing fiscal austerity it will simply take longer to accomplish the task. We intend to stick with the Master Plan and we appreciate your concern and support in this endeavor.

Senator **Nunn**. General Gray, from a national perspective, how should we structure our forces for contingencies and expeditionary mission? What kinds of forces do we need, what should the mix be, and how should these forces be structured for mid-intensity level conflict? What kinds of forces should be in the Active components and what should be in the Reserve components?

General **Gray**. While the political realities in Eastern Europe have changed significantly the world's geography has not. The vast majority of the world's population still lives and works on or near the sea, or along accessible waterways. Most of the world's commerce is still carried on the oceans highways. What has changed is that this is more than ever a world economy and we are more than ever a maritime nation with worldwide interests. Even as the threat of Communism and the Soviet military machine seem to be diminishing, regional threats to U.S. interests are growing in military, economic and political power. In this changing and uncertain world, the United States still needs to be able to project military power anywhere in the world to protect our national interests. But at the same time, we find our military presence less welcome and so it becomes more difficult to project military power from forward bases. The answer to this challenge is maritime forces which have the ability to be where the trouble is brewing without the need of forward basing.

We must structure our forces for mobility and versatility. These forces must be capable of deterring aggression by their ability to respond rapidly to a wide range of crises. These forces must have the following characteristics: high level of readiness, balance and flexibility, air-ground-logistics integration, rapid responsiveness without reliance on Reserve integration, and a credible forcible entry capability. These forces must truly be expeditionary, with organic close air support, assault support, air defense, antiarmor, light armor, engineer, reconnaissance and intelligence capabilities, and most importantly, they must be sustainable.

The Active forces must have sufficient combat power immediately available to deter conflict, meet recurring operational commitments and respond to multiple crises. 0ur Reserve forces must be adequately structured, equipped, and trained to assume a larger role in augmenting and reinforcing the Active forces when employed in high-intensity conflict. This total force approach will make the most efficient utilization of our constrained fiscal resources.

Senator **Nunn**. The structure of the Marine Corps has not been linked primarily and directly to the Soviet threat. What kind and size Marine Corps do we need for the future.

General **Gray**. An understanding of the role, utility, and over-arching national security requirements of our Nation is what has determined the focus of the Marine Corps on the non-Soviet threats. Marines have responded to 109 crises since 1945 with only a handful in response to Soviet actions. Our role in a global war scenario has been as part of a naval campaign along the flanks of Europe. Throughout the post World War II era Marines have remained clearly focused on our historical charter. In 1952 Congress recognized the need for a standing Corps of Marines who in partnership with the Navy would provide ready expeditionary forces necessary to protect U.S. interests abroad. The missions could include protection, suppression, and limited intervention. While armies could be mobilized for major conflicts, Marines could provide the forces for the interim, transitory expeditions.

Our Nation is a prisoner of geography, separated from the dominant world markets, national interests, and allies by the oceans. Today there are numerous regional powers either present or emerging that can endanger our citizens, interests and allies abroad. The difficulty in responding to these threats is one of geographic accessibility. The wisdom of the members of Congress in 1952 rings true today as we reshape our strategy. Marines are organized, trained and equipped to fight primarily in the low to mid intensity environs. Our three MEF's are geographically postured to ensure global coverage. Our ability to "sequentially" increase our forces from a forward deployed Marine Expeditionary Unit to a powerful 50,000-man Marine Expeditionary Force and to sustain these forces for extended periods far from our shores is an essential element of the National Strategy of a maritime nation. It is difficult to characterize roles and missions in terms of specific threats. While the Marine Corps has always been the least Soviet-focused of the armed services it is more instructive to view Marines in terms of capabilities rather than the use of those capabilities.

The Marines are organized today as the Nation's expeditionary force-in-readiness, poised to respond to contingencies with Air Contingency Forces aboard MAC aircraft, Expeditionary Units aboard amphibious shipping, and Brigade-sized forces in concert with Maritime Prepositioned Ships, or a combination of all three. The structure needed to provide the kind of global contingency response capability that we have today requires a minimum of 180,000 Marines and three MEF's. Our unique Marine Air Ground Task Force organization has been bought, paid for and is on station, and ready tonight to provide our Nation with a global contingency response capability.

NAVAL GUNFIRE SUPPORT

Senator Nunn. Two battleships are being retired, and, at the present time, there are restrictions on firing any of the 16-inch guns. It appears that the fire support you would require in support of amphibious assault forces may not be available.

What is your assessment of the adequacy of naval fire support to conduct shore bombardment, suppress enemy air defenses, and attack other key targets? What is your opinion regarding the adaptation of the Army's MLRS and ATACMS for use on ships for naval fire support?

General Gray. Today, the minimum standoff distance for protection against a growing 3rd world anti-ship missile and sea mine threat requires over-the-horizon (OTH) tactics. The long standing surface fire support requirement for OTH operations is 60 NM's, as reflected in the 1985 Naval Surface Fire Support Improvement Study and the 1987 Naval Gun Fire Support Ship Study. Current 16-inch Gun capability for OTH support is 20 NM's and the 5-inch gun offers no possibility for OTH surface fire support. Therefore, the only fire support asset currently available to support the OTH amphibious assault is carrier (or land) based close air support. The S–1894 16-inch NGF improvement program, which extends the range of the 16-inch gun to approximately 37 NM's is currently a DON POM issue that provides a limited near-term solution to the OTH naval surface fire support requirement. Additionally, the "Assault Ballistic Rocket System (ABRS)", which is the navalized variation of the Army's MLRS, appears to be a promising concept to meet the long-term requirement for naval surface fire support to employed Marine Air-Ground Task Forces (MAGTF's). To date there is no program to address the OTH surface fire support requirement when the battleships are finally retired. We need to begin a RDT&E funding line now to address this deficiency. ABRS has been identified as a leading system in meeting the improved naval surface fire support system requirement.

Questions Submitted by Senator John Warner

Senator Warner. The proliferation of tactical ballistic missile technology, along with chemical and biological agent technologies in Third World countries, has increased the threat to our contingency/expeditionary forces that might be employed in these areas of the world.

Do you believe that we should accelerate the development of anti-tactical ballistic missile systems that can deploy with and protect our contingency forces?

General Gray. I concur with your assessment of the proliferation of tactical ballistic missile, chemical, and biological technologies in the Third World. These are three good reasons why we must stand well off shore with our amphibious task force and why I stress the over-the-horizon concept of coming from the sea. I place the development and procurement of anti-tactical ballistic missile systems for defense of the fleet on my list of priority programs. We must be able to defend against these type systems if we are to loiter off or close to potentially hostile shores.

ADVANCED AMPHIBIOUS ASSAULT VEHICLE

Senator Warner. The Marine Corps currently has a program to replace the current amphibious assault vehicle with a new one.

Would you describe the characteristics you want in the new vehicle and indicate when it would be fielded?

General **Gray**. By the turn of the century we will have to replace our current assault amphibian vehicles. With this in mind, the objective of the Advanced Amphibious Assault (AAA) Program is to obtain the most cost effective, operationally suitable and affordable system which can lift the surface assault elements of a Marine Air-Ground Task Force (MAGTF) from amphibious ships located over-the-horizon (OTH) to inland objectives. In general, the AAA system must provide a forcible entry capability and serve as the principle means of tactical surface mobility for the landing force during subsequent combat operations ashore. The Tentative Operational Requirement (TOR) lists the following as characteristics of the AAA system:

Water speed: 20-25 k (22-30 mph) in Sea State 3

Land speed: Sustained cross country speed of 30 mph

Surf capability: Negotiate 8-10 ft plunging surf

Payload: 17-18 Marines

Crew capacity: Not more than three Marines

Weapon system: Defeat Soviet light armor combat vehicles (BMP, BMD, BRDM) with PK of 0.8 at 1,500 meters while moving on land or water during night/all weather conditions

Survivability:
  NBC collective protective system
  Multi-shot fire suppressive system
  Hull protection without applique armor against 14.5mm HMG fire
  Overhead protection against artillery fragments (152mm)
  30mm protection at 1,000m (desired) frontal 60 degrees

As part of the RD&A process (to support Milestone 1) for the AAA program, we are currently conducting a Cost and Operational Effectiveness Analysis (COEA) to assess the operational effectiveness and suitability of the proposed AAA characteristics.

SOLDIER-MARINE ENHANCEMENT PROGRAM

Senator **Warner**. Last year the Congress provided $18 million to the Army and $12 million to the Marine Corps for the development and acquisition of items to improve the effectiveness of footsoldiers. What is the Marine Corps doing with this money and should the program be continued?

General **Gray**. This program should be continued. Congress provided $11.678 million to the Marine Corps in fiscal year 1990 for enhancing the infantryman's combat capability. The enhancement was to be attained through the development and evaluation of "off the shelf" more lethal infantry weapons and improved "foot soldier" load bearing equipment, field gear, survivability items, communications equipment and navigation aids. The specific items are as follows:

1. Rifleman's Assault Weapon/$2.0 Million

A Non Developmental Item (NDI) ordnance item launched from a rifle's muzzle that permits the individual rifleman to breach concrete walls and other urban targets from ranges out to 250 meters and from within protective enclosures.

2. Over Snow Mobility Suite/$3.0 Million

This program will operationally test a suite of state-of-the-art individual snow mobility items including skis, ski march boots, poles, bindings, assault snowshoes, and a family of equipment and casualty sleds. The intent of this program is to replace the 1950's technology currently in service with lighter, better snow mobility equipment designed with performance, comfort, and individual preventive injury in mind.

3. Extreme Cold Weather Shelter/$1.0 Million

This program will operationally test an NDI four-man, 15-pound tent designed to provide protective shelter in extreme cold weather conditions. This is both a load reduction effort and quality of life/war fighting enhancement initiative.

4. Combat Load Enhancement/$1.5 Million

This program will survey the available state-of-the-art individual equipment used by the armies of the world with the intent of procuring the best of what is available for operational testing. Items included in this initiative include, but are not limited to, flashlights, individual rain protective gear, entrenching tools, lightweight stretchers, and individual shelters. Much of the equipment of this type that is currently in the active inventory is of World War II design. Lighter, more efficient equipment exists and would enhance the quality of life and combat effectiveness of our Marines.

5. Antipersonnel Obstacle Breaching System (APOBS)/$0.95 Million

A man portable, fire and forget, mine and wire neutralization/clearing system that creates a continuous 45 meter long x .6 meter wide cleared foot path. Employed by two men in 30 seconds, the system provides the Marine with a 25 meter standoff from the mine field. This system will replace the bangalore torpedo which has been in service since World War II at a weight savings of 5:1. This $.95 million will be added to the current Marine Corps funding of $1.5 million to accelerate the full scale development (FSD) portion of the program.

6. Reconnaissance Patrolling Insertion/Extraction Equipment/$1.178 Million

This initiative includes a number of associated items that support reconnaissance/raid operations. An example of the type equipment included in this initiative is the small unit water purification unit. That system allows a four-man team to live off the land's available water using a 1 pound unit that provides 10,000 gallons of purified water between filter changes.

7. Special Operations Force Mountaineering Equipment (SOFME)/$0.2 Million

This initiative will procure the necessary systems for an operational test of special climbing equipment. The SOFME provides a light weight system used for cliff assaults and urban scaling operations.

8. Personal Tracking System/$0.25 Million

These funds will procure and operationally test an individual locator/tracking system that weighs ounces but will permit rescue teams to quickly locate individuals that get lost, separated, or captured during reconnaissance/raid operations.

9. Flame Retardant Assault Suit/$O.2 Million; Hazardous Material Gas Mask/$O.15 Million

These two initiatives go together. Together the system will provide an individual with the ability to survive in an airless, 2,000 degree fire environment for approximately 2 minutes.

10. Load Bearing Equipment (Assault)/$0.2 Million

Under this initiative, special load bearing equipment for assault/raid units will be procured and operationally tested. The equipment will be light weight, providing only for the portability of the war fighting necessities associated with raid operations.

11. Special Operations Improved Cryptographic System/$1.0 Million

These funds will provide for the operational test of a new, Non-Developmental Item secure voice radio system that weighs 1.5 pounds and is 3.6 x 5.5 x 2.1 inches in size.

12. Small Unit Navigation System/$0.05 Million

Two state-of-the-art systems from two manufacturers will be operationally tested under this initiative. These systems weigh less than 5 pounds, are 6.5 x 7 x 2 inches in size, and can provide a unit with its position anywhere in the world with an accuracy of plus or minus 25 meters.

Senator **Warner**. One of the areas where we never seem to do a very good job is in the protection of the soldier's extremities—his feet and hands.

In your opinion, how satisfactory are the boots and gloves currently issued to our Marines? Are there any other items of equipment or personal gear that deserves special attention?

General **Gray**. The current boots and gloves are satisfactory except in persistently cold and wet weather. In this regard, the Congress has begun to correct this deficiency through the fiscal year 199O Army appropriation for the intermediate cold wet boot. The Marine Corps is currently working with the Army on this program and will be a user when fielding is started.

The Marine Corps is also working with the Army to field new gloves that will be satisfactory in intermediate and extreme cold weather environments. These gloves will be tested this winter and fielded in the following summer.

Yes, there are other items that deserve attention primarily related to reducing the combat load of the infantryman. We have a defined but currently unfunded requirement of $5.5 million in Research and Development, $5.4 million in Procurement, Marine Corps and $15.4 million in Operation and Maintenance, Marine Corps to buy these items.

Questions Submitted by Senator Edward M. Kennedy

Senator **Kennedy**. Chairman Nunn and others have argued that the Department should be taking steps to develop lighter, more lethal forces. Your prepared statement [page 11, last full sentence on the page] says that you have been taking steps to lighten the "lift footprint" of the Active forces. You specifically mention that you are shifting some heavy equipment to the Reserve. Are there other actions you are taking to make the Marine Corps lighter?

General GRAY. In addition to shifting some of our heavier assets into the Reserves, we have initiated several actions that increased the expeditionary nature of our forces. By the end of June 1990, we will have replaced all of our M109 155mm (53,940 lb) and M110 8" (62,500 lb) self-propelled howitzers in the Active force with the equally capable but more mobile M198 155mm towed howitzer (15,800 lb). We are also developing the requirement documentation to define our need for an expeditionary tank to better adapt our mechanized forces for contingency operations. We anticipate that this expeditionary tank will replace the M1A1 Main Battle Tank. This lightweight tank will increase the strategic mobility while reducing the logistics burden of our mechanized forces. Further, we are conducting a FMF-wide T/O and T/E review with an emphasis on eliminating large, extraneous, heavy equipment and consolidating support functions/equipment wherever possible. Finally, a study has been initiated for the purpose of revalidating fuel consumption rates applicable in an expeditionary environment with a view toward reducing our quantity of bulk fuel equipment.

Senator KENNEDY. The fiscal year 1990 appropriations process added AH-1W tank-killing helicopter for the Marine Corps Reserve program. Although this committee did not originally authorize these aircraft last year, we were persuaded that they would make a useful contribution to capability and agreed to authorize them. The House Armed Services Committee withheld authorization. Now, however, we have been led to believe that the Marine Corps has added AH-1W aircraft to its outyear program.

Would the AH-1W program, in your view, be an example of a way to make Marine Corps forces more lethal?

General GRAY. Yes, it would. The AH-1W Super Cobra is an extremely versatile platform, capable of carrying the following weapons: TOW, HELLFIRE, SIDEARM, SIDEWINDER, 20 mm gun, 2.75 inch rockets, and 5 inch ZUNI rockets. Thus, the Super Cobra is well suited for close-in fire support, anti-armor, and self-defensive anti-air missions. I know of no other attack helicopter in the inventory that can boast such versatility and performance, especially at such a low unit cost. The AH-1W is, indeed, a significant force multiplier.

Senator KENNEDY. If it were true that the AH-1W had been added to the outyears, wouldn't the absence of aircraft in the fiscal year 1991 budget cause a break in production?

General GRAY. I do not think there is any way to avoid a production break in 1993 without AH-1W procurement in fiscal year 1991. Although we do plan to procure additional Super Cobras in the outyears, the AH-1W simply did not have the requisite priority in the fiscal year 1991 budget when all of the DON programs were competed.

Senator KENNEDY. What other initiatives are you taking to make the Marine Corps more lethal?

General GRAY. While the current capabilities of the Marine Corps are impressive, we are not being complacent. The Marine Corps is striving to tailor and to fine tune our total force for projected requirements. The central aim is to improve our current forces capability for its expeditionary mission.

Our ground combat capability was improved by the Soldier-Marine Enhancement Program of last year. Funds were provided for the continued development and procurement of more lethal infantry weapons and improved "soldier items" to include lighter, more comfortable load bearing equipment, field gear, communications equipment, and navigation aids.

To improve our infantry battalion's antiarmor capabilities we are developing the Advanced Anti-tank Weapons System - Medium (AAWS-M). The AAWS-M will replace the Dragon which is not effective against improved conventional and reactive armor. The AAWS-M with its increased reliability, higher hit/kill probability and greater effective range will significantly increase our antiarmor capability.

This year we will begin to receive the M1A1 tank. The M1A1's increased survivability, lethality, and mobility will meet the Marine Corps near and mid-term main battle tank requirements against threat armor.

We are continuing to improve our aviation assets by upgrading the avionics of our fixed-wing aircraft and enhancing the night vision capability of our helicopters.

These initiatives will provide us with highly mobile and self-supporting forces that are capable of rapidly massing forces and firepower from dispersed locations and capable of operating at the same tempo day or night under all weather conditions.

Senator KENNEDY. There has been substantial discussion of the plan to terminate the AV-8B Harrier program in fiscal year 1992 before you have completed buying the inventory objective of 323.

Are you looking at other alternatives for filling the gap this would leave?

Do you have any intention or desire to revisit the decision to terminate the AV-8B before the Marine Corps inventory goal is satisfied?

General GRAY. We are not looking at any alternatives to the AV-8B. The recently completed Department of the Navy Integrated Amphibious Operations and USMC Air Support Requirement Study determined that the Marine Corps would have sufficient Harriers at the end of the fiscal year 1991 procurement to meet our near-term warfighting requirements.

We anticipate that, through normal attrition, we may have to take another look at our inventory in the mid-1990s to determine whether we have sufficient assets to meet our warfighting requirements. We are confident that the cooperative program with Spain and Italy will keep the production line active so that we will not be faced with restarting the production line in the event that additional aircraft are required before a follow-on system is fielded.

QUESTIONS SUBMITTED BY SENATOR WILLIAM S. COHEN

Senator COHEN. General Gray, Secretary Cheney said last year, in testimony before the House Armed Services Committee, that the V-22 appeared quite expensive, relative to its "specific, fairly narrow mission in moving Marines from ship to shore.

Is this the only such mission for the V-22? Would you comment on the tactical mobility this vehicle would bring to the Marine Corps?

General GRAY. While there has been much discussion lately about "limited missions" for the V-22, I think we should keep in mind that the Assistant Secretary of Defense for Program Analysis and Evaluation issued a memorandum several years ago in which he enumerated 26 potential missions for the V-22, throughout the Department of Defense. I am convinced that those 26 missions will not fully exploit the capabilities of the aircraft and that the V-22 will not reach its potential until well after it is introduced into service.

Tactical mobility is a key factor in maneuver warfare, but mobility means more than simply moving from one place to another. On the modern battlefield, regardless of the level of conflict, tactical mobility includes advanced force operations, deceptions and feints as well as getting the right forces to the right place at the right time. The helicopter, with its slow speed, limited range, and small payload constrains our operational flexibility and does not provide sufficient advantage over the capabilities of potential adversaries.

The ship-to-shore movement of Marines, equipment, and supplies is one of any missions envisioned for the V-22. I think we must remember that getting the Marines ashore in an amphibious operation is only one stage of a complex evolution. There is a tendency to think of amphibious operations in the context of World War II, where frontal assaults were conducted because we did not have the mobility to do otherwise. That historical viewpoint tends to substitute rotorcraft for landing craft without due consideration of the threat and without giving credit for the evolution of amphibious warfare over the past 50 years.

Current and future threats dictate that we put more emphasis on over-the-horizon operations and on avoiding enemy strengths. Such a concept requires that we operate over longer distances and with greater speed and agility than is available in today's helicopters. These characteristics are important during the initial assault phase of an amphibious operation, but they are equally important during subsequent operations ashore where the outcome of potential conflicts will be determined.

Senator COHEN. According to the plan established last year to shift A-6 aircraft from the Marine Corps to the Navy, the Marines will receive additional two-seat F/A-18 replacements.

The radar on the F/A-18 does not provide an air-to-ground delivery capability comparable to the A-6, so a radar upgrade is required; what is the status of plans to upgrade the radar on the F/A-18?

General GRAY. The current F/A-18 radar, the APG-65, provides excellent capability for day, under-the-weather ordnance delivery, but it does not have night, all-weather capability comparable to the A-6. The on-going radar upgrade program incorporates hardware enhancements that will accommodate the needed software changes required to provide night, all-weather operations.

Senator COHEN. Why does the Marine Corps have a requirement for a medium lift helicopter? Why is it not sufficient to have simply two helicopters, the CH-53E and the H-60?

General GRAY. The Marine Corps requirement for a medium lift rotorcraft is predicated upon two principal criteria; warfighting capability and resources. Both of these factors must be considered in meeting our mission requirements.

From a warfighting perspective, our medium lift fleet is the cornerstone on which the remainder of our assault support aviation force is built. The vast majority of our personnel, equipment, and supplies are transported by medium lift helicopters, currently the CH-46. This is, in a sense, our "general purpose" helicopter—large enough to accomplish most missions, yet small enough to allow operations in small zones and aboard ships.

Our other helicopters are "special purpose" aircraft, designed for specific missions: AH-1W for assault fire support; UH-1N for airborne command and control; CH-53E for heavy lift. Each of these aircraft is used for other missions as required, but the primary missions are the ones for which they are best suited.

The CH-53E is a superb heavy lift helicopter, but is not an assault helicopter. Its size, design, infrared signature, and operating envelope make it extremely vulnerable in operations involving a significant threat. The aircraft was designed to externally transport heavy equipment to areas where the threat has been reduced to acceptable levels, and it does that mission very well.

The H-60 is also a fine aircraft when used in the missions for which it was designed, but it does not have sufficient payload to meet Marine Corps requirements for assault operations. One of the key factors in amphibious operations is the rapid build-up of combat power. Since we would not be using the CH-53E in the assault waves of an operation, a CH-53E/H-60 fleet would require that we use the H-60 to transport all the personnel. In order to accomplish that task in time, we would be required to have almost twice as many H-60s as we now have CH-46s. In that event, we would also require an additional LPH, LHA, or LHD from which to operate. The alternative is to double the amount of time it would require to get an equivalent force ashore, and the losses we would likely suffer in that scenario would be unacceptably high.

From a resource perspective, a CH-53E/H-60 force would be more expensive than a medium assault rotorcraft alternative. It would require more pilots, more maintenance personnel, more ships, and more operating funds in order to provide equivalent combat capability. Our requirement for a medium lift replacement aircraft is equally valid as when first validated in 1968.

LX SHIP

Senator COHEN. What can you tell us about the characteristics of the future LX?

General GRAY. The requirement for LX is acknowledged by both the Navy and the Marine Corps. The recently completed DON Integrated Amphibious Operations and USMC Air Support Requirements Study recommended that the LX be LPD-like and that its design consider the requirements of our day-to-day forward deployments. The primary mission of the LX will be to debark elements of the landing force by both LCAC and helicopter/VTOL aircraft from over-the-horizon. Design characteristics—to include multi-mission considerations—are currently under consideration by Navy and Marine planners.

Senator COHEN. Why should the LX be built? In your opinion, when should the first LX be authorized?

General GRAY. In the 11 years between 1996 and 2008, 53 of today's 64 ships will reach the end of their active service lives. The LX will address the shortfalls created by the 83 percent reduction in lift capability these ships represent.

It would be more appropriate for the Navy to answer this question; however, it is commonly acknowledged that funding must begin in fiscal year 1995/96—*No later than fiscal year 1996.* Once design for LX is firm, a fiscal year 1995 start *may* require some advance procurement in fiscal year 1994.

QUESTIONS SUBMITTED BY SENATOR JOHN McCAIN

Senator McCAIN. What are the military and economic impacts of cutting the present Active force structure of the Marine Corps from three MEFs to two? What are the military risks, and what are the savings relative to those risks?

General GRAY. The military impact is a dramatic reduction in strategic flexibility of those forces configured explicitly to counter the most likely threats to our interests. For example, executing the most plausible though still unlikely scenario facing us today; namely, conflict on the Korean Peninsula, would entail great risk while at the same time stripping the remainder of our fleets of their Marines. Second, a two MEF Marine Corps would reduce by at least one-third the number of naval, expeditionary, power projection force options available to the NCA in a world where simultaneous or sequential instabilities are real possibilities. Finally, a two MEF Marine Corps means more than just fewer Marines. Loss of one-third of the force structure will stress the capacity of the "residual" Marine Corps. Competing demands between efforts to *both* support, train, and expand (when needed) operational forces *and* deploy Fleet Marine Forces will collide. In the event of a reduced end strength, it is conceivable that MAGTF's could be smaller and therefore less capable to handle the threat. As measured by any of these three examples or cumulatively, risk to military or foreign policy successes will increase proportionately.

Savings will be difficult to find. They may even be as elusive as the "peace dividend". This is primarily because those vital deterrence and response capabilities foregone by the disappearance of a "third MEF" remain an indispensable part of the baseline of forces needed to protect our global interests. Without a doubt, other light, quick response forces will be showcased as able to fill this void. But reconfiguration or substitution costs and additional demands that are certain to be placed on the strategic lift system (air) to transport and sustain these alternative forces will not be negligible. In the face of current fiscal stress, additional outlays that replicate capabilities already in existence make little financial or political sense.

Senator McCain. What are the unique capabilities of the Marine Corps that limit our ability to replace cuts in the Corps with U.S. Army forces? What would the cost-benefits be of using Army forces as a substitute for the Corps?

General Gray. To answer in reverse order: There would be no cost-benefits of using Army forces as a substitute for the Corps. First, the cost-effectiveness of the Corps—our ethic of austerity and frugality—has been demonstrated over the years in budget after budget and program after program, and, along with our demonstrated ability to fight and win, is the main reason we have survived the efforts of those who would "simplify" things by replacing us with an amphibious element of the Army. You don't improve cost-effectiveness by substituting more expensive, less effective forces.

As to the "unique capabilities": One would have to start with the very nature of the two services, and the functional responsibilities that their capabilities are designed to fulfill, to understand why a substitution of Army for Marine makes no sense. We are naval, and the Army is continental. Our equipment, training, and doctrine is designed to support our role with the Fleet, and our participation in naval campaigns. To ask the Army to abandon, or decrease, their orientation toward and responsibility for sustained land operations in continental campaigns in today's fiscal climate is to imply that they could adopt and execute a naval role as well, and cheaper, than current forces who literally "wrote the book," and whose expertise reflects over two centuries of operational experience.

Our ability to operate from the sea, and particularly our ability to conduct amphibious operations, are truly unique capabilities, as is our ability to conduct Maritime Prepositioning operations. Both are dependent upon unique training, equipment, and operational experience with the Navy that the Army couldn't duplicate without a massive reorganization, restructuring, and re-equipping While they must be able to participate in amphibious operations, they have not had the ability to conduct the assault phase, or an independent operation of any size, for decades. The combination of amphibious and maritime prepositioning operation capabilities provides two additional unique Marine capabilities, those of truly global forward-presence, and an intervention capability to include forcible entry. Both are pillars of the national military strategy, and neither would survive an attempted Army transplant.

It should be noted that eventually the Marine Corps fights on land, in a self-contained, self-sustaining air ground task force that is fully capable of both joint and single service operations, while the Army is immediately dependent upon Air Force support in any demanding scenario. It is not, in fact, a simple Army-Marine substitution. Our ability to fight on land makes it possible for us, however, to conduct similar operations, as was demonstrated in World War I, Korea, and Vietnam.

Senator McCain. What do you feel about the idea of regionalizing the Marine Corps and the Army, with the Corps taking over most of the missions in the Pacific and the Army taking over most of the missions in the Atlantic?

General Gray. It would be wrong to assign missions by region. The services are charged with providing forces that possess functional capabilities for combat operations within their fundamental role. For the Marine Corps, the role is a naval one, in naval campaigns, and in operations ashore in support of naval campaigns. For the Army, the role is largely in sustained land warfare, in continental campaigns. Both of us provide our forces to the "warfighting CINCs," who use them in executing their NCA-assigned missions. The "missions" assigned our forces should accommodate their functional capabilities, which are geographic dependent to the extent that naval campaigns involve oceans and littorals, and that continental campaigns involve large land masses and, possibly, their littorals.

While a regional approach to service employment would therefore be illogical—we should support all CINCs that have a need for our functional capability—there is no denying that there is some de facto regionalization of forces. The Army's role in Europe, for instance, has driven their force size for years because it is the primary area where their functional capabilities are needed. Similarly, Marine operating forces are assigned to the Atlantic and Pacific unified commands because their "domain" consists of the oceans and littorals of the world. To that extent, we are already "regionalized." The Corps takes pride in the fact that our demonstrated combat capabilities make us relevant in almost region, and that we indeed do fight in any "clime and place."

A short answer is "missions should be assigned based on functional capabilities and assigned responsibilities, not geography."

Senator McCain. If we have to make trade-offs between the size of the Corps and its modernization, what are your priorities? Would you like to retain its present size or fund modernization efforts like the V-22, M-1 tank, and similar major programs? What are your key modernization priorities in this climate of budget cuts?

General Gray. The Marine corps has the only seabased, sustainable forcible entry capability in the U.S. Armed Forces, which can be used across the spectrum of conflict. Many Third World countries have high-tech forces, and even guerrilla armies can have a potent antiarmor and antiaircraft capability. Therefore, even a "low intensity conflict" can be very intense. I do not believe that it is prudent defense policy to reduce this unique capability which is usable across the full spectrum of conflict. However, recognizing the constrained fiscal climate we are entering and the competing demands of manpower and modernization, I would be willing to make some trade-offs of structure in order to continue modernizing our Corps.

No Marine Corps requirement is more pressing than the need to identify a solution for the replacement of our current medium lift assault assets. The aging CH-46 helicopter, now 26 years old, is rapidly reaching the limits of its service life. While it has served us well, the realities of 21st century combat make prudent its replacement with an aircraft which will guarantee our ability to carry Marines into harm's way on the modern battlefield.

To compliment our vertical assault capability, we are pursuing the development of an advanced amphibious assault vehicle. This program is critical to gaining a true over-the-horizon power projection capability.

To expand the operational capabilities of our light armored family of vehicles we intend to continue expansion of this program to acquire an assault gun variant and an air defense variant. These lightweight, readily transportable, highly mobile assets will add tremendously to our ability to operate at any level of conflict.

In pursuing these capabilities, I can assure you that we will not tarnish our reputation for frugality. We will ensure that our modernization efforts procure weapon systems that are both mission capable and cost effective.

CONTINGENCY RESPONSE

Senator McCain. General Gray, in view of the possibility that more than one crisis could occur at the same time, as the possibility exists with Liberia and the Philippines, how many operational combat forces could you marshall tomorrow to handle multiple crises? How many of those forces are already deployed aboard ship? How many could be transported by strategic airlift?

General Gray. The three Marine Expeditionary Forces (MEFs) in existence today provide geographic reservoirs for deployed or ready-to-deploy Marine Air-Ground Task Forces (MAGTFs). These forces (approximately 122,000 Marines) coupled with our Marine Corps Security Forces (approximately 11,000 Marines) are the operational muscle of the Marine Corps. Utilizing a variety of deployment options (Amphibious Ships, Maritime Prepositioning, Airlift Contingency, etc.), the total Marine Corps operating force could respond tomorrow. Our response to the Philippine crisis demonstrates this capability. A combat capable force of 20,000 Marines with 112 aircraft and 30 days sustainment could have been employed within 4.5 days by combining:

— In-place naval and diplomatic security forces.

— A Marine Expeditionary Unit embarked in amphibious ships standing in the Western Pacific.

— Air Contingency Forces from Okinawa, Hawaii, and California.

— The Maritime Prepositioning Ships Squadron in Guam.

This formidable force was ready and could have been deployed with minimal reliance on airlift (155 Aircraft Sorties). Our ability to project sustainable, combined-arms forces throughout the world exists today. Taking a snapshot in time, over 9,000 Marines were at sea in amphibious ships on June 20, 1990. These forces spanned the globe ranging from the east coast of the United States to the waters off Liberia and both the Eastern and Western Pacific. On the same day, an air contingency force of 1,000–2,000 men in each MEF was ready to deploy within hours and three brigades with 16,000–17,000 men each were prepared to fall-in on the equipment aboard the Maritime Prepositioning Ships. The Norway Airlanded Brigade, another paid-for deployment option utilizing prepositioned materiel, was also prepared for deployment on June 20.-

Senator McCAIN. General Gray, Marines aboard ships are currently off the coast of Liberia prepared to evacuate U.S. citizens if the need arises. Why are maritime forces more of an advantage for this kind of operation than using airborne forces as employed for the Panama operation?

General GRAY. While many reasons come to mind, let me provide at least four. First, while many would view the less than immediate response time of amphibious forces, as compared to air-lifted forces as a shortcoming, this is rarely the case. Indeed, in a world where diplomats welcome any initiative that buys precious time, the transit time from the Mediterranean to the waters near Liberia has proven useful. It allowed American diplomats to support a forum that has temporarily slowed down the tempo of violence. Second, once off shore and poised over the horizon, naval forces, capable of remaining on station indefinitely, have arguably lent credence to the U.S. Ambassador's initiatives without directly committing U.S. forces ashore. The controllability of transit and loiter times, which are facets of naval forces and unavailable to air-lifted CONUS based contingents, appears to have influenced the pace of events. Third, the distance from CONUS (where U.S. airborne forces are primarily based) to Liberia is considerably greater than that to Panama. Airbridges are complex and fragile military undertakings. Finally, the capability of amphibious ships to provide an immediate staging base for operations and safe haven for evacuees cannot be replicated by airborne forces or the Military Airlift Command. In short, Panama reflects the successful application of certain forces in a very unique scenario. However, Liberia epitomizes the type of distant interests of this Nation, the multitude of constraints before our military planners, the added diplomatic dimension of naval forces, and the timeless value of ready and flexible Marine forces.

Senator McCAIN. Doesn't the United States have the capability to respond in some other way to a crisis which might develop in areas not covered by reducing the Marine Corps to two MEFs?

General GRAY. Not exactly. It is important to note that the crisis drives the task organization and required capabilities of the reponse. Combat forces that cannot be employed from or by aircraft in a hostile, live-fire landing-zone, ground forces that are hard pressed to commence an operation until their complete troop list is in country, and lightly-armed forces that are short on sustainability have limited utility as the initial phase of a crisis/contingency response effort. Capabilities that don't fit the demanding requirements of distant, expeditionary operations, along the littorals of the world, should more appropriately be viewed as complements to, rather than substitutes for, Marine forces.

MARINE CORPS END STRENGTH

Senator McCAIN. General Gray, didn't you recently cut the Corps' end strength, why?

General GRAY. From fiscal year 1987 to fiscal year 1989, your Corps has reduced end strength by 2,569. This cut was taken to meet a $50M funding reduction imposed by the HAC for fiscal year 1988. Our end strength request for fiscal year 1990 is 196,735 and the end strength request for fiscal year 1991 is 196,500. The fiscal year 1990 end strength reflects an additional decrease of 465 from the fiscal year 1989 authorized by level. The 465 decrease is the result of a Congressional General Provision. Our end strength decreases from fiscal year 1990 to fiscal year 1991 by an additional 235 as a result of savings related to the streamlining of Defense Agencies and a reduction for the retiring of aging equipment. If the fiscal year 1991 end strength request is authorized, the Marine Corps' cumulative end strength reduction since fiscal year 1987 would be 3,025.

FORCE STRUCTURE

Senator McCAIN. Won't a reduction in the amphibious forces of the Navy impact on the Marine Corps?

General GRAY. Marine Corps end-strength is not linked to amphibious shipping levels. We stand ready to deploy by multiple means for employment in a variety of contingencies. This said, however, the Marine Corps' primary and most distinct mission remains power projection ashore by means of amphibious assault. A reduction in the Navy's amphibious forces decrements a national resource and limits CINC and National Command Authority (NCA) flexibility. Additionally, each reduction proportionally increases Marine Corps reliance on already scarce, hard-pressed strategic air and sealift assets.

Senator McCAIN. With regard to contingency forces, what does the Nation need in terms of capabilities for the foreseeable future?

General GRAY. Any discussion of our requirements for contingency forces must take into account an examination of our Nation's national interests, existing and anticipated threats and our national strategy. With this in mind we must not lose sight, especially in the present environment of uncertainty, that the United States has been and will continue to be a maritime Nation with global economic and political interests. Because of the evidence of growing nationalism and the expanding gap between rich and poor nations, many Third World developing nations vital to the interests of the United States and its trading partners are possible fertile breeding grounds for insurgencies. These insurgencies have the potential to jeopardize regional stability which could spill over and endanger access to vital economic resources. Regional instability becomes more critical as our Nation and allies, as well as potential adversaries, become more and more dependent on the world's strategic resources. If we are to have stability in these regions, maintain access to their resources, protect our citizens abroad, and deter conflict, we must maintain within our active force structure a credible military power projection capability with the flexibility to respond to conflict across the spectrum of violence throughout the globe. To this end, we must maintain a balanced fleet. Carrier Battle Groups (CVBGS) are without question the most useful and frequently employed-for-deterrence and crisis-response fleet asset. Additionally, as a vital part of the balanced fleet equation, we must have expeditionary and amphibious forces which will enable our theater commanders to respond to crises on a real-time basis, or to extend the depth of the maritime battlefield onto land through the forcible introduction of flexible, sustainable, and above all, credible landing forces. The bottom line is that we must maintain, on a continuous basis, sufficient forward deployed naval expeditionary forces in order to retain a simultaneous two-ocean, rapid contingency response force.

Senator McCAIN. You have addressed the issue of "sequencing" forces in the past. Could you explain what is meant by the term?

General GRAY. It is often not necessary, required or possible to deploy all forces in a single lift. Thus we design a deployment plan which "sequences" or phases Marine forces into the objective area. The reasons for sequencing forces include:

1. Lack of strategic lift.
2. Depending on the requirements of the operation/campaign, all forces or all types of forces may not be required at the outset. An example would be if the mission is to deter.
3. All forces may not be logistically supportable in the early phases of the campaign.
4. Finally, sequencing forces is a way of organizing the often extended and dispersed activities of the campaign into more manageable parts, allowing flexibility of execution.

Expeditionary Marine forces are capable of deploying by a variety and combination of means which we refer to as the pillars of strategic deployment. These include strategic airlift, amphibious lift, and maritime prepositioning. Our forward-deployed forces can spearhead the deployment since the battle, or the deterrence of battle often goes to the force that gets there first. Additionally, a forcible entry capability, a Marine Corps hallmark, is often required to ensure the introduction of follow-on deploying forces.

In response to the requirement to rapidly sequence Marine forces in support of joint commanders, we have prepared an array of crisis action modules (CAMs). CAMs are building blocks which allow the sequential flow of Marine combat forces to the warfighters. By employing a variety and combination of deployment options, the Marine Corps makes best use of the Nation's limited strategic lift assets while providing expeditionary, flexible, versatile, and sustainable forces. As an extension of this concept, these modules can also be written into operations plans for use in non-crisis situations.

Senator McCain. How is the Marine Corps now satisfying its medium lift assault requirement, and what lies ahead in the future?

General Gray. The Marine Corps medium lift assault fleet is currently made up of CH-46E helicopters which entered service during the late 1960s and early 1970s.

We are considering various options for modernizing our medium lift assault fleet since the termination of the V-22 program last year. The Secretary of the Navy has directed us to wait until the V-22 Cost and Operational Effectiveness Analysis is completed before pursuing any specific course of action.

OTH

Senator McCain. Where does the Corps currently stand on its ability to project its forces from over-the-horizon amphibious shipping?

General Gray. The Navy/Marine Corps have been building to the over-the-horizon (OTH) requirement since 1983. Such a capability exists today to execute OTH assault at the MEB(AE) level and is the basis for current training exercises. The Navy expects to achieve 100 percent of the requirements for a MEF(AE) over-the-horizon assault with LCAC in fiscal year 1991. Total MEF(AE) plus MEB(AE) over-the-horizon LCAC assault could be achieved in fiscal year 1998, if current shipbuilding and LCAC procurement projections remain unchanged.

The Marine Corps can project amphibious forces from over-the-horizon today. However, with conventional helicopters and amphibious assault vehicles, we can not come from as far or as fast from over-the-horizon with the survivability needed to face the threats of the future. Present technology simply enables an adversary to see farther, make decisions faster, respond quicker, and if necessary, shoot more accurately at greater ranges. We require a capability which can be 1,000 miles at sea one night and into the objective area the next morning if we are to outthink and outmaneuver opponents in the future.

We employ LCAC and our current fleet of helicopters during operations and training exercises to routinely initiate assaults from beyond the visible horizon, at night, under adverse weather conditions and with minimal electronic emissions. To answer the challenges of tomorrow's battlefield, we must develop and procure replacements for our current medium lift aircraft and our assault amphibious vehicle.

COUNTERNARCOTICS OPERATIONS

Senator McCain. Does the Marine Corps have a role in counternarcotics operations?

General Gray. The Marine Corps has been and will be a major contributor in the Nation's efforts to eliminate the flow of illicit drugs into the country. Some of the areas where the Corps will contribute to the counternarcotics effort are:

Supply side

- Personnel Support
    - DEA
    - Unified and Specified Commands
    - ONDCP - staffing of the Regional Logistic Support Offices
- Operational Support
    - Detection and monitoring flights in the Caribbean, the Gulf of Mexico, off the coast of Florida and in the Pacific
    - Air surveillance radar for the CINCs as requested
    - Mobile Training Teams (MTT) in support of requests from host foreign governments
    - Operations in support of law enforcement agencies (LEA) within the continental United States particularly along the southwest border
    - Training for LEAs in military small unit tactics and fire arms
    - Intelligence support for LEAs to aid them in the formal collection, production and dissemination of tactical intelligence
    - Providing equipment to U.S. law enforcement agencies as well as foreign governments

Demand side

- Use the Marine Corps Community Drug Education and Assistance Program (MCO 5355.4) to encourage Marines to become involved in community oriented drug prevention programs, i.e., Scouting programs, latchkey children's programs, church groups, elementary and high schools, prisons, etc.

— Provide assistance to State correctional departments in establishing youth correctional programs

— Utilize the Marine Junior Reserve Officer Training Corps (MJROTC) to influence the attitudes of high school students concerning drug use and abuse

The impact the Corps has already had in support of DOD's efforts to support the President's anti-drug program assures its continuing contributions.

AMPHIBIOUS SHIPS

Senator McCAIN. Are you currently satisfied with the profiles on amphibious shipping?

General GRAY. Given the constrained budget situation in the Department of Defense since the mid-1980s, the amphibious shipbuilding program as it exists in POM-90 is adequate. The Department has understood and supported the requirements for development of a balanced fleet, and consequently the amphibious shipbuilding program to date has been adequately protected. The current POM-92 development process will be significant in determining the shape of U.S. military forces in general, and amphibious shipbuilding in particular, through the year 2000.

Our greatest concern is that there be sufficient amphibious shipping to sustain our forward deployed forces while maintaining a credible, two-ocean contingency response capability through the block obsolescence years (fiscal years 1996–08) when over 80 percent of today's amphibious ships are scheduled for retirement.

Senator McCAIN. What are your ideas on armor/antiarmor mix and does it include a main battle tank?

General GRAY. The Marine Corps' role in operations across the full spectrum of conflict requires a main battle tank and an array of antiarmor weapons as key ingredients to the combined arms effort of the Marine Air Ground Task Force. When analyzing the potential threat we recognize that not only industrialized, but many Third World nations maintain credible armored and mechanized forces. MAGTF armor/antiarmor doctrine and equipment must be designed to defeat such threats without armor parity. The Marine Corps has recently completed an armor/antiarmor requirements study. The results of our study have led us to the following conclusions and recommendations:

The primary role of the tank in the Marine Corps is to function as a supporting arm. The tank is optimized during offensive operations and during defensive operations it is best employed in situations to regain the offensive. The Marine Corps' current tank, the M60A1, is outdated and lacks the capability to defeat the potential threat. The MlA1 satisfies the Marine Corps' immediate requirement for a main battle tank. While the M1A1 is a suitable replacement for the M60A1, the MlA1's design characteristics are optimized within a set of parameters that do not exactly match those of a MAGTF organized for expeditionary operations. The nature of likely future conflict requires the Marine Corps to possess a main battle tank (MBT) which optimizes the attributes of mobility, firepower, and armor protection in a manner that complements the Marine Corps' style of warfare. Such a tank places a premium on strategic and tactical mobility as well as firepower, while preserving a degree of survivability commensurate with the threat and method of employment. Presently, we have identified a requirement for a lighter weight tank and are in the process of validating that requirement.

Marine Corps antiarmor weapons must possess charcteristics that allow individual infantrymen to destroy individual tanks in close combat. Light and medium weapons must be man-portable, fire and forget, and available in large numbers. Heavy crew-served and vehicle-mounted weapons should also be fire and forget and adaptable for many uses, including those used by aircraft. These would be augmented by a broad range of indirect fire antiarmor weapons. Finally, antitank mines and specialized explosive munitions should round out the antiarmor arsenal, giving the MAGTF a broad range of tactical and technical options to deal with potential threats.

The Marine Corps' current inventory of antiarmor weapons is considered adequate against most armor threats. However, the threat is changing. Numerous countries are modernizing their armored and mechanized forces either through new acquisitions or upgrading their current inventory. In order to defeat this potential threat we have begun a program to improve our antiarmor capability. The Short Range Antiarmor Weapon (SRAW), and the Advanced Anti-tank Weapons System - Medium (AAWS–M) are planned replacements for the AT-4 and the M47 Dragon respectively. The TOW2, our present heavy antitank weapons system, will be replaced by the TOW2A and TOW2B which provide upgraded flight motor, a thermal beacon and additional armor penetration.

Senator **McCain**. The Light Armored Vehicle (LAV) proved very successful in operation "Just Cause." What are the variations that you envision?

General **Gray**. The current family of vehicles consists of the following variants: LAV-25, LAV-Anti-Tank (LAV-AT), LAV-Mortar (LAV-M), LAV Logistics (LAV-L) and LAV Recovery (LAV-R). In addition to the current family of vehicles, there are two variants of the LAV currently undergoing development. These are the LAV-105 and the LAV-Air Defense (AD). The LAV-105 is an LAV chassis that will mount a 105mm tank cannon. The mission of the LAV-105 is to provide large caliber direct fire in support of missions assigned to the Light Armored Infantry (LAI) Battalion. Likely targets that will be engaged by the LAV-105 are fortified emplacements, personnel concentrations, and other targets of opportunity. The LAV-105 will make maximum use of its inherent mobility, firepower and protection. The LAV-105 will be manned by a crew of three: commander, gunner, and driver.

The LAV-AD will provide a highly mobile air defense capability to the LAI battalion against enemy helicopters and low flying aircraft. This capability is an integral part of the LAI Battalions' organization for combat. The LAV-AD will be manned by a crew of three: commander, gunner, and driver.

The U.S. Army Tank Automotive Command (TACOM) recently awarded a contract to Cadillac Gage to develop three LAV-105 vehicles for research and development. The LAV-AD is undergoing developmental testing and is expected to begin operational testing in June 1991.

Senator **McCain**. Is there any truth to the rumor that foreign competitors will eventually acquire the technology developed during the V-22 R&D process?

General **Gray**. There are two separate entities that I think would be interested in obtaining technical data or expertise from the V-22 R&D process. First is EUROFAR, a consortium of European helicopter manufacturers, and second is the Ishida Group of Japan.

I think it is only reasonable to assume that both organizations have benefited from the termination of the V-22 program as engineers and other technical experts migrate from Bell Helicopter and from Boeing Helicopters as a result of lay-offs or job instability. In fact, the Ishida Group has recently broken ground in Texas to build a facility to develop and produce their TW-68 tilt-wing aircraft. One of their top executives is a former Department of the Army employee who was technical director of the V-22 program in its early stages.

I do not know to what extent this personnel and technical migration is taking place, but if the V-22 program is not restored, or if program instability continues, I think there is a strong likelihood that the lead the United States now enjoys in tiltrotor technology will quickly evaporate.

Senator **McCain**. Is the ongoing crisis in Liberia a good example of the type of utility amphibious forces have in responding to circumstances which threaten U.S. interests? Why?

General **Gray**. Yes. We would offer that the type of utility or military value that will characterize your Marine Corps' response, to threats to our Nation's interests, meet the "FIRST" test. They must be *F*lexible; for optimum employment in the face of multiple or uncertain tasks. They must be *I*ndependent; not reliant upon bases or overflight rights to ensure mission success. They must be *R*ecognizable; a known and proven commodity whose presence, as a measure of U.S. resolve, is a force for stability. They must be *S*ustainable; capable of immediate and continuing application of combat power. Finally, they must be *T*imely; either already on scene or able to maximize their deployment/employment options to the best advantage of the Nation's interests. Liberia is an excellent example of tomorrow's crises. It is highly unlikely that we will be fortunate enough to arrange for all of our future crises to occur in the backyard of our out-of-CONUS warfighting CINCs. Neither will we always be afforded the luxury of months of detailed, in-country planning, and a host nation infrastructure that included intelligence, command/control, and logistics support. That is what separates a crisis from a contingency. Amphibious forces have met the "FIRST" test.

QUESTIONS SUBMITTED BY SENATOR TRENT LOTT

AMPHIBIOUS LIFT

Senator **Lott**. The Navy's stated goal for Amphibious Lift capability is to be able to provide enough lift to support the assault echelons of a Marine Expeditionary Force (MEF) and a Marine Expeditionary Brigade (MEB). The Marine Corps historically maintained a lift requirement for two MEFs.

In your opinion, does the mission require the Marine Corps lift sufficient to employ two MEFs, or will less be sufficient?

General GRAY. The Marine Corps has long maintained that the amphibious lift *requirement* is for the assault echelons of two MEFs. This mission requirement *supports CINC global war plans.* Recognizing that attainment of two MEFs of amphibious shipping is fiscally unrealistic, the Marine Corps has agreed to the considerably lesser *goal* of lifting the assault echelons of a MEF+MEB. This provides an amphibious force which sustains at least half the CINCs required capacity and still maintains a reasonable peacekeeping capability.

Senator LOTT. Do we currently have enough amphibious lift to meet the Navy's stated objective to lift one MEF and one MEB?

General GRAY. No. The Navy currently has the capability to lift slightly more than the assault echelon of a MEF. It is significant to note that lifting a force of this size would require the Navy to "swing" ships from one coast to the other.

Senator LOTT. It is my understanding that the Navy's Shipbuilding and Conversion budget may recommend eliminating additional purchases of LCACs beyond 1992. Assuming this is true, the LCAC program which was originally scheduled for a buy of 110 boats would be reduced to 84 boats.

If you only get 84 LCACs, can you fully meet your mission requirements?

General GRAY. LCAC procurement is based on the amphibious force supported by amphibious lift requirements and goals.

The Marine Corps has long maintained that the amphibious lift *requirement* is for the assault echelons of two MEFs. This mission requirement supports CINC global war plans. In keeping with the philosophy of matching LCAC procurement with lift available, a minimum of 156 LCACs would be needed to fully meet the Marine Corps' mission *requirement.* Therefore 84 LCACs represents approximately half the Marine Corps mission *requirement.*

Recognizing that attainment of 2 MEFs of amphibious shipping is fiscally unrealistic, the Marine Corps has agreed to the considerably lesser *goal* of lifting the assault echelons of a MEF+MEB. Based on the 1983 and 1987 DONLIFT studies, the longstanding programmatic buy to support this goal was 107 LCACs. Based on the recently completed DON Integrated Amphibious Operations and USMC Air Support Requirements study, 104 LCACs are required to support the same fiscally constrained *goal.*

Eighty-four LCACs would sufficiently support the assault echelons of one MEF (78 LCACs) or three MEBs of amphibious lift (72 LCACs). Operational experience now indicates that two training squadrons are required, ideally formed from six LCACs on each coast.

Senator LOTT. A significant advantage of the Marine Corps' power projection capability is its over-the-horizon assault capability from amphibious shipping.

How is this capability impacted by reduced funding for amphibious shipping?

General GRAY. Amphibious ships provide the platforms from which sea-based expeditionary assault forces are positioned and launched from over-the-horizon (OTH). These amphibious ships also carry the means to sustain these assault forces once employed ashore.

Reduced funding for amphibious shipping does not affect our capability to carry out OTH operations. However, reduced funding for amphibious ships impacts upon the number of amphibious platforms available to position, launch and sustain expeditionary forces from over the horizon and, therefore affects the size of the assault forces that can be deployed and employed for OTH operations.

FORCE STRUCTURE

Senator LOTT. Recently a Navy/Marine Corps team completed a study of the Integrated Amphibious Operations and USMC Air Support Requirements. The intent and focus of the study was to identify for future budget consideration future Amphibious/Air Support Requirements, based upon three levels of potential conflict—Low, Medium, and High intensity conflicts.

According to this study, a minimum of 7 LHDs, 5 LHAs, 8 LSD41s, 5 LSD49s and 14 LXs are *required to meet the lowest intensity conflict projected as probable missions for the Corps.*

Do we currently have the capability to meet this *lowest level* requirement?

Does reducing the Corps by one division, in any way, ease this lift deficiency?

General GRAY. The intent and focus of the cited study is to identify various force capability levels for future budget considerations. "Low", "Mid", and "High" refer to three levels of *threat* (projected to 2010) and not to intensity of conflict. The study provides three *illustrative* force level "packages" or options, all aligned to the most likely future threat—the "mid-threat."

The "lowest" force level "package" supports the three USMC aircraft wings at a minimum level, continues support of forward deployed forces, and provides sufficient assets to respond to a contingency requiring a credible forcible entry capability in *one ocean*. In *this* context, we currently have the capability to meet the lowest level requirement.

The purpose of amphibious lift, as well as other lift options such as strategic airlift and maritime prepositioning forces is to provide fleet commanders deployment flexibility and increase the national capability to rapidly respond to crises with a credible force. These force deployment options are more often complimentary and not necessarily cumulative. Changes to Marine Corps force structure do not produce excesses in amphibious lift.

Senator LOTT. General, in your statement you allude to the limitations of existing vertical assault support and explicitly identify a requirement for a replacement for CH-46 and CH-53 aircraft.

I am becoming increasingly concerned that we are not pursuing a very wise solution to this problem. Why should we spend millions to modify old, less than adequate technology, when we have the high tech V-22 as a real option? If we don't buy the V-22 now, in 10 years we may be buying this technology back from someone else.

Would you comment on your Medium Lift Requirement and your options for meeting it?

General GRAY. Our medium lift requirement is based on the need to replace our aging CH-46 fleet of helicopters. By the mid-1990s, those aircraft will begin to enter a period of block obsolescence. We are 10 aircraft short of our inventory requirement today, and most of the CH-46s have exceeded their 20-year projected service life. Our requirement to replace those aircraft has reached the point of urgency.

Since last year's termination of the V-22 program, we have looked at a number of options to meet our medium lift requirement. One of the alternatives is to pursue the development of a new helicopter, and another is to develop a derivative of the CH-46. Neither of these options will meet our requirement fully, and both will be expensive. The Secretary of the Navy has directed that we wait until we have the results of the V-22 Cost and Operational Effectiveness Analysis before we make a final determination on which Medium Lift Replacement program to pursue.

Senators McCain and Lott asked a total of five questions concerning loss of operational capability in relation to loss of end strength. These five questions are paraphrased in the following question:

Senators MCCAIN and LOTT. What capabilities would the Marine Corps lose if reduced to two Marine Expeditionary Forces (MEFs)? What end strength is required if current readiness and contingency responsiveness is to be maintained?

General GRAY. In order to discuss coherently the capabilities that would be sacrificed if the Marine Corps were to be truncated to two MEFs, it is important to begin with a brief assessment of the current three-MEF organization and the capabilities three MEFs afford this Nation's defense.

The Marine Corps consists of three combat divisions and three aircraft wings, as provided for by the National Security Act of 1947, as amended. The Congressional Record, preceding the amendment of the law, indicates that in establishing this structure, the Congress intended the Marine Corps to be a "versatile expeditionary force in readiness, always combat ready." The Marine Corps would be "versatile, fast-moving, and hard hitting." It would be capable of having a "powerful impact in relation to minor international disturbances," "prevent the growth of potentially large conflagrations," and hold "full-scale aggression at bay while the American Nation mobilizes its vast defense machinery."

To perform this role as a force in readiness, the Marine Corps has organized its three divisions/wings/force service support groups into three MEFs, which can be deployed for combat in smaller task organizations as Marine Expeditionary Brigades (MEBs), Marine Expeditionary Units (MEUs), or Special Purpose Forces (SPFs). We currently maintain one MEF continuously deployed in the Western Pacific, have a standing forward-deployed special operations capable MEU(SOC) in both the Pacific and Atlantic Oceans, and routinely deploy MEBs worldwide for training and exercises. For large contingencies we would employ a MEF, or potentially MEFs, in support of our Nation's interests.

Although amphibious Operations remain the forte of the Marine Corps, our roles as a force in readiness and as an expeditionary force are more significant in determining size and necessary capability than the number of available amphibious ships. Although amphibious forces have an unparalleled utility for maintaining an overseas presence, for supporting forced-entry operations, and for seizing beachheads, the Marine Corps expeditionary capability as a force in readiness can also be supported using Maritime Prepositioning Ships and air-landed forces. Because of multiple deployment options, our doctrine and inherent organization are designed to ease compositing into larger task organizations. Accordingly, forward-deployed amphibious forces are likely to be the "spearhead" for larger expeditionary forces. With this in mind, our forward-deployed MEU(SOC)s serve as the forward element of MEBS, and a forward-deployed MEB as the forward element of a MEF.

Significantly, each Marine Air-Ground Task Force (MAGTF) may, and most likely will be dissimilar in size and capability based on assigned combat mission. That is, each is organized and deployed to accomplish the specific task assigned. The consistency of our organization rests in our division, wing, and force service support group tables of organization. These organizations, and their subordinate elements, are essentially identical to their counterparts throughout the Marine Corps, and act as reservoirs for the component parts that make up MAGTFs tailored for specific missions. Changes in Marine Corps end strength are immediately reflected in reduced manning in the units within these basic organizations. Based on our analysis, reductions below Marine Corps end strength of 182,000 will necessitate reductions in these basic organizations that will significantly reduce this Nation's expeditionary capability. Ultimately, smaller, less capable MAGTFs can be sourced from the resulting smaller division/wing/force service support group organization. Unified Commanders will be required to accept reduced, forward-deployed Marine Corps p resence, smaller and less capable MAGTFs, and degraded flexibility in task organizing expeditionary forces for specific requirements.

As a Nation we require a global response capability that provides maximum flexibility to decision makers and sends a clear signal to our potential adversaries. Our ability to respond simultaneously in two oceans would be significantly degraded if the Marine Corps is reduced to 159,000—regardless of whether the reduction resulted in three significantly smaller MEFs or two MEFs roughly equivalent in size to those we have today. The smaller size would necessitate a reduction in our forward-deployed capability. Being forward-deployed, particularly in the Western Pacific, permits movement of in-theater forces rapidly via strategic airlift, amphibious shipping and through maritime prepositioning ships, or a combination of all three. This presence allows us to respond to crises with credible, and sustainable forces significantly faster than deploying equivalent forces from CONUS.

Reducing Marine Corps end strength to 159,000 will necessarily reduce the size and capability of the Marine Corps' operating forces. Such a reduction would significantly degrade the Marine Corps' ability to provide the kind of forces we believe Congress intended our Nation to have when it amended the National Security Act to prescribe the organization of the Marine Corps as three divisions and three aircraft wings.

The military impact of such a reduction is a dramatic change in strategic flexibility of those forces configured explicitly to counter the most-likely threats to our interests. For example, executing the most plausible, though still unlikely scenario facing us today—namely, conflict on the Korean Peninsula—would entail great risk while at the same time stripping our fleets of the remainder of their Marines. Second, a two-MEF Marine Corps would reduce, by at least one-third, the number of naval expeditionary, power projection force options available to the NCA in a world where simultaneous or sequential instabilities are distinct possibilities. Finally, a two-MEF Marine Corps means more than just fewer Marines. Loss of force structure will stress the capacity of the "residual" Marine Corps. Competing demands between efforts to *both* support, train, and expand (when needed) operational forces *and* deploy MAGTFs will result in reduced flexibility. As measured by any of these three examples, or cumulatively, risk to military or foreign policy successes will increase proportionately.

Although the historical baseline end strength of the Marine Corps since War II has been about 180,000, the issues that should drive future Marine Corps end strength are operational requirements. The United States is a Maritime Nation that must maintain the capability to defend its worldwide interests in an increasingly multi-polar world. Even as we are all encouraged by the events in Europe, we must remain prepared for the instabilities such radical changes precipitate. The world remains littered with the same types of insurgencies, the same challenges to our interests, and the same threats to American citizens from a hostile environment that we have faced since World War II.

I would summit that as we restructure our Armed forces for the future, that we remain cognizant of our historical need for a rapidly deployable expeditionary force. I am concerned that in discussing potential reductions in the Marine Corps, we may be discussing reducing the forces that have been precisely designed, organized, trained and equipped for utilization at this moment in our history.

[Whereupon, at 11:46 a.m., the committee was adjourned.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1991

TUESDAY, JUNE 19, 1990

U.S. SENATE,
SUBCOMMITTEE ON PROJECTION FORCES
AND REGIONAL DEFENSE,
COMMITTEE ON ARMED SERVICES,
Washington, DC.

DOD STRATEGIC LIFT REQUIREMENTS AND CAPABILITIES

The subcommittee met, pursuant to notice, at 9:40 a.m. in room SR-222, Russell Senate Office Building, Senator Edward M. Kennedy (chairman of the subcommittee) presiding.

Committee members present: Senators Kennedy, Exon, Dixon, Shelby, Cohen, McCain, and Lott.

Committee staff members present: None.

Professional staff members present: Creighton Greene.

Minority staff members present: Romie L. Brownlee, deputy staff director for the minority; George W. Lauffer, Durwood W. Ringo, Jr., and Mark B. Robinson, professional staff members.

Staff assistants present: Elizabeth Ann Harlow, Lori M. Jackson, and Lisa H. Kettlewell.

Committee members' assistants present: Andrew W. Johnson, assistant to Senator Exon; William J. Lynn, assistant to Senator Kennedy; Charles C. Smith, assistant to Senator Dixon; Leon S. Fuerth, assistant to Senator Gore; Terence M. Lynch, assistant to Senator Shelby; Dale F. Gerry, assistant to Senator Cohen; Patrick F. McCartan, assistant to Senator Wilson; Anthony H. Cordesman, assistant to Senator McCain; Robert M. Soofer, assistant to Senator Gorton; and Charles G. Pearcy, assistant to Senator Lott.

OPENING STATEMENT OF SENATOR EDWARD M. KENNEDY, CHAIRMAN

Senator KENNEDY. We will come to order.

The subcommittee meets this morning to consider the Department of Defense programs to achieve strategic lift goals. It is essential that we reconsider our priorities in this era of changed threats and circumstances. The underlying rationale driving strategic lift needs, the reinforcement of Europe after a major Warsaw Pact attack, has altered dramatically.

Ironically, the disintegration of the Warsaw Pact has had a mixed impact on lift needs. On the one hand, warning times have increased substantially, giving the United States more time to move reinforcements across the Atlantic if that need arises. On the other hand, we are likely to have fewer forces deployed in Europe, so that the overall reinforcement needs in the event of a conflict will be greater.

The reductions in East-West tensions have not eliminated the possibility that U.S. military forces will be needed to defend our interests in other parts of the world. We need to maintain the capability to transport and sustain our combat forces against a variety of potential regional threats.

In this hearing we will hear testimony on how the Department of Defense is reevaluating our strategic lift capability in light of these changed circumstances. In particular, we need to examine the impact on two major programs: the C-17 transport and the plans for a new fast sealift ship.

With regard to the C-17, the central questions are how many aircraft are needed and on what schedule. In the recently completed major aircraft review, Secretary Cheney reduced the C-17 program by nearly 50 percent, from 210 to 120 aircraft, and he also slowed the procurement schedule. These changes reflect two important new realities.

First, because the decline of the threat in Europe has reduced the need to increase our airlift capacity, the primary rationale for the C-17 now is not to provide added capacity, but to sustain existing capacity by replacing the aging fleet of C-141s.

Second, the stretch out of the C-17 production schedule acknowledges the need to make further progress in flight testing before the production rate is increased. The problems with the B-1 bomber stand as a monument to the danger of proceeding too quickly from development to production.

With regard to sealift capability, the committee has long been concerned that these programs have received too low a priority in the Department of Defense. Although sealift is crucial to any major movement of U.S. forces abroad, programs to improve this capability have been underfunded. DOD repeatedly has sought to reprogram the funds that the committee allocated in last year's budget for research on new sealift technologies. Now that Congress has rejected this reprogramming, we hope that the Department will move forward on this essential research.

The committee is also interested in a proposal by the shipbuilding industry to use government assistance to reenter the global commercial shipbuilding market and thereby support the domestic shipbuilding base.

The committee will hear from three groups of witnesses this morning. The first panel is from the Department of Defense and will address the implementation of the national sealift policy and what may be happening to verify the demands for total lift capability.

The second panel of witnesses will address the issue of the C-17. A representative from the General Accounting Office will discuss development and production with respect to the Air Force C-17 procurement request as adjusted by Secretary Cheney. The Air Force witness will provide information on the Department's view of the adjusted program.

Finally, we will hear from the President of the Shipbuilder's Council of America with respect to the proposal by the domestic shipbuilding industry for a shipyard recovery program.

Our first witnesses representing the Department of Defense, are Mr. David Berteau, the Principal Deputy assistant Secretary of Defense for Production and Logistics; and General Hansford Johnson, the Commander in Chief of the United States Transportation Command.

We look forward to hearing from both of you, but I will ask my colleague to say whatever he would like to say.

Senator COHEN. No trouble at all, Mr. Chairman.

Just let me welcome the witnesses and say that because there are changed threats in the world does not mean that there are no threats in the world. And indeed, the notion that because of our new relationship or emerging relationship with the Soviet Union, we somehow have more warning time, this does not mean that we have that much additional response time or that we gained much.

The fact is, our requirement for lift is not likely to decline, but it may even increase, depending on how it is allocated. Military planners indicate that lift consists of airlift, sealift and prepositioning. Secretary Cheney has indicated that we have adequate air and sealift, but I believe that assumption is based upon the fact that we have so much prepositioned equipment in Europe.

And as that changes and evolves, depending upon the nature of our relationship with the Europeans and NATO, it may very well cause us or force us to have additional lift requirements in airlift and indeed sealift.

I thank you, Mr. Chairman, for calling also Mr. Stoker, who is the head of the Shipbuilders Council, to talk about some of the sealift requirements that we need.

Senator KENNEDY. Senator Dixon.

Senator DIXON. Mr. Chairman, I will put the bulk of my remarks in the record, but I am delighted to see my good friend, General Johnson, here this morning, who is out at Scott Air Force Base, only five miles from my home in Belleville.

Also, Mr. Chairman, I did not know that your committee picked on Mr. Berteau. We always have him in my subcommittee and everybody picks on him there, but I see now that he just travels around among all the subcommittees. It is great to see him here this morning. [Laughter.]

I just want to say very quickly, Mr. Chairman, that I enthusiastically support the C-17, which I think will go a long way toward solving our airlift deficiency. As Secretary Cheney and others have pointed out, it will provide the flexibility that we will increasingly require. For example, the C-17 can land on the shorter runways often found in the Third World, and can handle direct delivery of outsized cargo.

The committee has heard recently from General Gray and General Stiner that the C-17 will be a great help to the Marine Corps and the special operations community. I think the C-17 is a must-have capability. For this reason I am concerned about the Secretary of Defense's decision to cut by more than half the total number of aircraft we plan to buy. And as I have argued many times, I believe that the changes that are occurring in the world mean that we need the C–17 even more.

And I thank the Chair.

[The prepared statement of Senator Dixon follows:]

Prepared Statement of Senator Alan J. Dixon

Mr. Chairman, I am delighted that the Armed Services Committee will hear testimony today on the Nation's strategic lift requirements and capabilities. I welcome our distinguished witnesses from the Defense Department, Air Force, General Accounting Office, and Shipbuilders Council of America.

This is a very important hearing because we are discussing an area—strategic lift—that becomes even more essential given the changes that are occurring in the world. It is clear to all that the United States will significantly reduce forces stationed abroad as we adjust to the diminishing threat of conventional war with the Soviet Union in Europe, and the transition to a post cold war era. But it is equally certain that we will continue to face challenges to U.S. security interests around the globe. The United States must possess capabilities to deter these potential threats, and to address them if necessary.

I am convinced that the need for strategic lift capabilities—both airlift and sealift—becomes increasingly critical in this emerging new national security environment. We must be able to move our forces from the United States, where they will be primarily based in the future, to potential far-flung trouble spots. I do not believe that the country now has sufficient airlift and sealift capabilities to meet these force projection needs. We should give serious consideration to reorienting navy shipbuilding priorities toward sealift.

Fortunately, the C–17 will go a long way toward solving the airlift deficiency. As Secretary Cheney and others have pointed out, it will provide the flexibility that we will increasingly require. For example, the C–17 can land on the shorter runways often found in the Third World, and can handle direct delivery of outsize cargo. The committee has also heard recently from General Gray and General Stiner that the C–17 will be a great help to the Marine Corps and the special operations community. The C–17 is a must-have capability, and for this reason I am concerned about the Secretary of Defense's decision to cut by more than half the total number of aircraft we plan to buy. As I've argued here today, I believe that the changes that are occurring in the world mean that we need the C–17 even more.

Mr. Chairman, I look forward to hearing from today's witnesses.

Senator **Kennedy**. Very good.

General, we are delighted to have you here. I appreciated the opportunity to visit with you privately a couple of weeks ago. We look forward to your testimony. Would you like to start, General?

STATEMENT OF HANSFORD T. JOHNSON, GENERAL, USAF, COMMANDER IN CHIEF, UNITED STATES TRANSPORTATION COMMAND

General **Johnson**. Yes, sir.

I would like to make a brief comment. The comments that you and your fellow Senators have made certainly shows the great importance of the defense transportation system to our Nation. Our national defense needs certainly are high, but our economic needs are also very high.

Transportation is vital to our country. We are faced with worldwide and local conflicts that transportation has to respond to. Ultimately, of course, our job is to support the warfighting Commanders in Chief (CINCs) around the world. Our system must be capable of evacuating Americans, responding to humanitarian activity around the world, and delivering forces. These needs depend on our organic transportation assets as well as our commercial transportation system in the air, on land and at sea, and as Senator Cohen mentioned, also on prepositioning.

Our job is to support these warfighting CINCs, and we in Transportation Command provide an integrated and balanced approach to providing mobility.

We depend on the speed and flexibility of airlift, the capacity and endurance of sealift, the breadth and depth of our Nation's land transportation resources, and undergirding all of this, the strengths of our commercial transportation system.

Although people are not part of my testimony today, I am compelled to acknowledge that the people are the bedrock to making our system work. They are important and vital to the success of our transportation role.

The Transportation Command's role in peace and war is to provide mobility not only to our CINCs, but around the world. These requirements are based on the size of the force to be moved, the composition of that force, the distance to be moved, the required delivery date, and as Senator Cohen mentioned, the prepositioned stocks that are available upon arrival, as well as port reception capability.

In reviewing the status of our U.S. Transportation Command, airlift is performing very well. JUST CAUSE showed our capability to deliver troops and equipment very, very quickly. The airlift commercial sector is also very strong. Our challenges in airlift revolve around the C–141, which, as I believe you mentioned, is rapidly reaching the end of its useful life, and of course the need for the C-17.

I visited Douglas Aircraft Company last week, and I have seen tremendous progress since my last visit in February, including a great recognition of the problems that they face and a teamwork approach from the company, to the inspectors, to the project officer.

Our sealift forces move approximately 95 percent of the dry cargo, and 99 percent of the petroleum products. The Navy's fast sealift program is working very well, and we believe the Ready Reserve Force, the RRF, is in good shape. However, we rely on the commercial sector for 90 percent of our sealift, and that commercial sector is eroding rapidly. We face many challenges as we work to motivate and assist the industry in developing a competitive commercial sealift capability.

The President signed a National Security Sealift Policy. This will be helpful. It will show a need for continuing operating differential subsidy reforms, which are being considered by the Secretary of Transportation.

In the surface transportation area, the industry is doing well. The infrastructure is sufficient to support our needs. We all know that we need to do some work on bridges and some railways in our country.

The last area of my command's interest is the Command, Control, Communications and Computer C^4 System. This is the system that ties together all the industry, as well as our organic capabilities. We have the challenge of pulling together many existing systems, and we are making good progress, with tremendous cooperation from industry, as well as in house, in developing a global transportation network.

In summary, the U.S. Transportation Command is heading in the right direction, with significant challenges ahead: bringing the C-17 on board, rejuvenating the maritime industry, developing a command and control system for all of our transportation needs, and expanding Transportation Command's role in peacetime, as well as wartime activities.

Thank you, sir.

[The prepared statement of General Johnson follows:]

STATEMENT OF

GENERAL HANSFORD T. JOHNSON

COMMANDER IN CHIEF

UNITED STATES TRANSPORTATION COMMAND

INTRODUCTION

Mr. Chairman and distinguished members of the subcommittee, thank you for this opportunity to appear before you to discuss an issue of ever-increasing importance in our rapidly changing world: Strategic Mobility.

On 1 October 1987, the United States Transportation Command was established to provide global air, land, and sea transportation to meet national security objectives. In USTRANSCOM's short history, we have seen a dramatic change in the international geopolitics which shape our world. The Warsaw Pact's influence on the balance of power in Europe has weakened, regional conflicts have led to the proliferation and use of high technology and chemical weapons, and an increasing number of Third World nations have developed the capability to manufacture and employ nuclear weapons. Nations today are still very much at odds over ideology, cultural values, and economic interests. At the conventional level, the United States will best be prepared to protect its interests around the world and prevent military adventurism by maintaining a credible deterrent posture through strong alliances and a capable, global conventional force.

Strategic mobility lies at the heart of this credible deterrent posture, for without the ability to project forces there is no conventional deterrent. The capability to rapidly bring overwhelming military power to bear on an aggressor at the time and place of our choosing, and the ability to sustain that effort for as long as it takes to persevere, is central to our defense. USTRANSCOM provides that capability.

The worldwide military transportation system is complex and wide ranging. Unlike geographic unified commands, our area of responsibility spans the globe, moving millions of passengers and tons of cargo each year through hundreds of different locations worldwide. USTRANSCOM is working with the Services, Unified Commands, Joint Staff and Office of the Secretary of Defense to integrate all elements of the military transportation system to provide the most effective and efficient use of airlift, sealift and land transportation resources; from origin to destination. Today, I would like to discuss in general terms the process of mobilization for contingency and war, and in specific terms the role USTRANSCOM will play in that process, illustrating the challenges we face in carrying out our responsibilities.

THE THREAT

The mobilization of forces, whether to protect U.S. citizens and aid an emerging democracy in nearby Panama, or to support a major conflict half way around the world, is a large and complex process which begins with a threat to our national interests. Today those threats are changing rapidly as old alliances crumble and emerging Third World countries gain economic and military power. In 1988, the Commission on Integrated Long-Term Strategy concluded that Third World countries have been involved in more than 30 limited conventional and 60 unconventional conflicts over the past 40 years. To the estimated 16 million lives lost in these hostilities can be added the undetermined toll exacted by terrorism and other forms of political violence throughout the world. Tomorrow's threat to U.S. interests will likely be smaller in scope than that posed by the Warsaw Pact, yet will place tremendous demands upon our ability to respond. These challenges will probably emerge quickly, with little advance warning, compressing available response time. The conflict will likely be at great distance from the United States in an area where we have little or no transportation infrastructure. The compressed reaction time, long distance and limited in-place transportation infrastructure will adversely affect our ability to project military force, requiring an increasingly flexible, balanced, and responsive transportation system.

PLAN DEVELOPMENT

The warfighting CINCs who rely upon USTRANSCOM for critical transportation support have begun the complicated process of planning to counter the changing threat environment. As they revise their strategies to fight to win against the changing spectrum of contingencies in their area of responsibility, new plans will begin to emerge. As we withdraw from overseas, these plans will likely require the support of an increased number of troops and equipment based in the United States.

There are four factors critical to USTRANSCOM which the warfighting CINCs must consider during their deliberate planning process. First, we must know the size and composition of the forces to be moved; second, where those forces will be required; third, when those forces must be delivered to ensure sufficient combat power arrives when its needed; and fourth, the capabilities and configuration of the offload points and follow-on transportation systems. When completed, this process results in a tasking to USTRANSCOM for mobility support.

PLAN REFINEMENT

At this point, USTRANSCOM begins to participate fully in the planning process. It is our responsibility to ensure the warfighting CINC's OPLANs are transportation feasible based on this nation's strategic lift capabilities. Central to our efforts is the time phased force deployment data (TPFDD) which outline where and when specific forces are required, as well as the follow on support required to sustain those forces. This data constitutes a movement forecast which USTRANSCOM will analyze, refine, and be prepared to execute. To remedy the discrepancy between deliberate planning and plan execution policies, procedures and computer support we are developing "The Joint Operation Planning and Execution System" (JOPES). The approximately 55 million dollars requested for JOPES in the President's FY91 budget will continue development and fielding of increasingly capable versions of this important system.

COMMAND AND CONTROL OF EXECUTION

When the decision is made to take action resulting from a crisis or short notice contingency, we move into planning the execution. The smooth transition from peacetime deliberate planning to crisis action, contingency, or general war requires the immediate and rapid expansion of our command and control systems to meet the National Command Authority (NCA) and Theater CINC's wartime demands.

USTRANSCOM operates a 24-hour, seven day a week command center which monitors continually the worldwide military/political situation and readiness status of our component units. Through our command, control, communications, and computer (C4) systems, we are able to monitor actively the hundreds of ships and aircraft which comprise our organic and DOD contracted transportation assets as they move around the world. USTRANSCOM is able to provide the NCA and supported CINCs with timely transportation advice--and our component commands with appropriate direction--before and during the early stages of crisis development. While C4 systems are important to the success of this command's daily operations, these systems are absolutely critical as we transition from peace to potential combat situations. All the lift capability in the world will not solve our strategic mobility problems if we are unable to control and track our lift resources. The flexibility to respond to changing circumstances, altering the flow of troops and materiel in mid-stream, vastly improves the efficiency of our deployment process. But it is not enough to merely know where our lift assets are at any given point in time; to truly optimize our limited number of ships and aircraft, trucks and trains, our users must know exactly what cargo is being carried by each of those assets, who needs that cargo and the ultimate destination of that cargo. The commercial transportation industry calls this capability "intransit visibility." Currently, the industry is focusing on flexible sharing of information for intermodal management and tracking of vehicles and cargo. USTRANSCOM is drawing upon this technology and integrating it into the military transportation system to provide a "network of systems" known as the Global Transportation Network (GTN). When completed, this network will allow users to access needed transportation information from existing private sector and DOD data bases. We are now testing this concept in the Pacific and European theaters with a GTN prototype using commercial technologies. An operational prototype will be fielded by the end of FY90. We have requested several million dollars in FY91 funds to continue our GTN development efforts.

EMPLOYING THE RESERVES

As a crisis or potential for contingency operations escalates, the NCA will need to begin mobilizing reserve forces, to include the call-up of commercial assets. This decision is critical to

USTRANSCOM's ability to carry out its mission in support of the warfighting CINC. Today, under full mobilization, over 80 percent of our command's manpower and nearly 85 percent of our lift capability comes from reserve or commercial sources. The 83,000 people we absorb during full mobilization will support the increased operating tempo of critical mobility functions such as port cargo handling, maintenance, and airlift aircrews. Another important element of mobilization is the activation of the Ready Reserve Force (RRF). The RRF is managed by the Maritime Administration and is composed of 96 militarily useful and specialized ships maintained in a 5, 10, or 20 day activation status. This fleet, which represents the government-owned sealift assets available to meet unilateral and surge shipping requirements, is taking on increased importance as our maritime industry continues to decline. It will take 225 million dollars in FY91 to maintain the RRF and attain its programmed growth to 105 ships. The viability of this fleet was jeopardized last year when 63 percent of the FY90 RRF budget request was cut. Budget authority for this important force in reserve has recently been reclassified as a defense related item. I urge you to support this program.

Our heavy reliance on the civilian transportation industry to provide wartime lift capability poses some unique challenges as we integrate these assets into the military transportation system. The Civil Reserve Air Fleet (CRAF) provides more than 30 percent of our cargo and 95 percent of our passenger capability. U.S.-flagged merchant ships provide the nucleus of our strategic sealift capacity when war commences; and all of our available ships, both civilian and government owned, will be operated by U.S. merchant mariners. Finally, we have a virtual 100 percent reliance on U.S. commercial rail and motor transportation for movement of troops and materiel to ports of embarkation.

THE COMPONENTS EXECUTE

Even as we consolidate our diverse strategic lift resources into a movement plan, positioning the correct mix of ships and aircraft at their onload points, we undertake the mustering, manifesting, loading, and stateside movement of troops and cargo. Managing this task falls primarily to one of our components, the Military Traffic Management Command (MTMC). In close coordination with unit-level transportation staffs and USTRANSCOM headquarters, MTMC ensures that the proper mix of trucks, trains, buses, and CONUS airlift is available at the right place and time to transport people and materiel to their ports of embarkation.

As equipment and personnel begin to arrive at the ports, all our components, the Military Airlift Command (MAC), the Military Sealift Command (MSC), and MTMC begin the difficult task of loading cargo and directing personnel onto the proper ships and aircraft to commence the strategic leg of their journey.

AIRLIFT: WHEN TIME IS CRITICAL

Due to its inherent speed and flexibility, we will rely primarily on airlift during the first 10 to 20 days of a conflict. When rapid reinforcement and arrival of supplies are required on short notice, there is no substitute for airlift. MAC's current airlift capability combines over 400 active duty, reserve, and Air National Guard aircraft and approximately 480 CRAF aircraft into a national airlift fleet capable of providing 48 million ton miles per day of cargo movement while meeting all our passenger lift requirements.

The workhorse of our organic strategic airlift capability is the C-141 fleet which last year flew nearly 271,000 hours supporting such diverse missions as combat airdrops in Operation JUST CAUSE, humanitarian airlift of supplies to the Caribbean in the wake of hurricane Hugo and support to earthquake victims in Soviet Armenia. On any given day, 75 percent of this fleet is committed to flight operations. Originally entering the inventory in 1963, these airlifters are rapidly reaching the end of their service life. Accelerating this aging process was the need for an aerial refueling capability and an increased use in the low altitude environment. The inflight stresses generated by both of these activities has resulted in more rapid than expected fatiguing of the C-141 airframe, causing a growing number of structural cracks to form in the wings. The threat environment which drove these operational changes is continuing to evolve and grow more hostile. The airlifter of the future will need to be more flexible, able to operate in the austere environment of short, semi-improved fields, delivering cargo directly to the battle in an increasingly complex threat environment. The C-17 is that airlifter. The multi-role capabilities of the C-17 will allow it to swing from its primary role of strategic airlift to the theater airlift role. This modern airlifter will be capable of moving large quantities of supplies, ammunition and outsized cargo directly to forward areas. This additional capability will be realized with lower manpower requirements and dramatically reduced operation and support costs when compared to our current fleet. The C-17 will form the cornerstone of our future airlift capability.

Changes in Europe and fiscal realities here at home have resulted in the recently announced restructuring of the C-17 program. This program will allow the nation to accomplish the modernization of its airlift fleet while meeting worldwide airlift requirements. As the scope of the worldwide threat evolves and our forces are restructured to meet the threat, this more capable, more responsive, and more flexible airlifter will play a critical role in U.S. military force projection.

Congressional support for the C-17 has been strong. I urge you to continue that support.

SEALIFT: THE BACKBONE OF SUSTAINMENT

As hostilities escalate and mobilization continues, sealift begins to play a larger role in the mobilization effort. The first ships activated will be the eight fast sealift ships operated by MSC. These ships are commercial container ships modified in the roll on/roll off configuration to easily handle wheeled and tracked vehicles. Ready to sail in four days, the tremendous capacity and speed of these ships make them a central component of the early strategic sealift effort. 49.2 million dollars has been requested for FY91 to maintain the readiness of these ships. Any reduction will jeopardize our ability to rapidly activate these critical assets.

In a major, sustained, overseas deployment, sealift has in the past and will continue to deliver approximately 95 percent of all dry cargo and 99 percent of all petroleum products. Although mobility studies and different scenarios will provide a wide ranging spectrum of sealift requirements, the consensus invariably points to one conclusion--our maritime fleet and its supporting industrial base are declining steadily. In 1970 there were 894 ships in the U.S. flag fleet. By 1989 that fleet had declined to 423, a reduction of 53 percent. The Denton Commission Report concluded that, unless significant changes are made in the way we do business, the merchant marine fleet will decline to less than 200 ships by the year 2000. The impact of this decline goes beyond concerns for defense transportation.

Today the United States, as the largest trading nation in the world, carries less than four percent of our trade in U.S. bottoms, creating the potential for this nation to be held economically hostage. This continued erosion of our U.S.-flagged sealift capability is clearly a national problem, which requires a national solution. Without adequate sealift, our economic well being can be jeopardized while unilateral military actions may not be feasible and our credible deterrent posture is weakened.

Over the last year, we have begun efforts to reverse this decline. The National Security Sealift Policy signed by the President on 5 October 1989, establishes the foundation upon which we must build a comprehensive program to ensure adequate sealift resources are available to meet national economic and security requirements. We must make that goal a reality.

To improve our response worldwide, we have a program of afloat prepositioning which will require approximately 458 million dollars in FY91. This funding will continue to provide 12 vessels loaded with equipment and supplies, strategically located in the Indian Ocean and Western Mediterranean to support a contingency or war. It also provides 13 Maritime Prepositioning Ships (MPS) that carry equipment and supplies for three Marine Expeditionary Brigades. Every ton of materiel in theater is one less ton we have to move with our limited transportation assets.

THE CHALLENGE OF DEBARKATION

The final challenge USTRANSCOM faces in moving forces and sustainment supplies to a theater is off-loading at the ports of debarkation. The challenges we must address in this phase of the operation include the maximum number of aircraft or ships a particular port can handle at any one time, available cargo handling and warehousing equipment and personnel, and the interface with follow-on transportation to move the men and equipment to the battlefield.

In some instances, we may be required to offload sealift cargo in damaged/unimproved or non-existent ports. To accomplish this mission, DOD relies on Logistics-Over-The-Shore (LOTS). Comprised of offshore dry and liquid cargo discharge systems, causeway systems, landing craft and tugs, LOTS allows us to continue operations where normal docking facilities and cargo handling equipment is unavailable, increasing our flexibility to respond to a fluid conflict environment. Funding has been requested to expand this capability. As we look to the future and see a growing probability of engaging in contingencies where there is limited or no transportation infrastructure, the importance of LOTS increases.

A vital component of LOTS is the auxiliary crane ship. These ships are converted dry cargo vessels with two or three sets of cranes added to their decks making them capable of offloading non-self sustaining container ships during LOTS operations or in unimproved/damaged ports. We have recently added the ninth auxiliary crane ship to the RRF. Funding for the 10th through 12th ship has not yet been secured.

READINESS

The success of our national strategy, the ability to fight and win, is in part dependent on USTRANSCOM's expertise in efficiently moving U.S. forces to or from any theater of conflict. To carry out the complex mission I've described, our components rely on the readiness of three distinct elements: active duty personnel, reserve forces and the civil sector. All three, in balance, are essential to the performance of the transportation mission. The readiness and training of these elements are directly linked to the daily activity level within the transportation system. The tempo of MAC's flying operations;

MSC's steaming operations; and MTMC's air, truck, and terminal operations are a result of every day service to our customers. Maintaining Service transportation funding at requested levels will ensure our components are adequately tasked to provide transportation for the Services, maintaining their readiness. When Service transportation budgets are reduced below requested levels, the result is a real loss of transportation system readiness. DOD has requested approximately 4.0 billion dollars in transportation funds for FY91 operations. These funds will ensure our military transportation system remains trained and ready to respond to any contingency; any place, any time. A shortfall in strategic mobility equates to a reduced combat capability and deterrent posture.

CONCLUSION

Mr. Chairman, thank you once again for the opportunity to provide the subcommittee my views on the United States Transportation Command's contribution to mobility and force projection. I believe our current and future military strategies will require additional, more flexible mobility assets to ensure their success. This nation will benefit from USTRANSCOM's integrated approach to transportation. We have forged new, stronger bonds between the members of the joint planning and execution community, and through this robust new relationship, we have instituted programs and procedures which markedly increase the effectiveness and responsiveness of the transportation system. The PROUD EAGLE 90 worldwide mobilization exercise demonstrated that the system, directed by USTRANSCOM, made up of the three transportation component commands, the CINCs, the Services, the Joint Staff, commercial industry and federal agencies has improved this nation's ability to mobilize for war. As we look to the future, we see continued integration of the functions that comprise our military transportation system. We are working to provide the theater CINCs and Services with a single point of contact for all their transportation needs, peace to war. The synergistic effects of a fully integrated transportation system would be truly impressive. Such an organization could provide real origin-to-destination visibility over troops and materiel moving within the system, minimizing the inherent turbulence when transitioning from peacetime to contingency to war. The increased economic leverage, lower overhead and simplified planning and execution of transportation requirements will help ensure this nation full productivity from every defense dollar spent on mobility.

The goal of USTRANSCOM is to support this nation's credible deterrent posture with a transportation system capable of projecting our forces anywhere, anytime. With the support of the Administration and you, the members of Congress, we will maintain the flexible, balanced and responsive mobility system so critical to achieving our national objectives.

Senator KENNEDY. Thank you. Mr. Berteau.

STATEMENT OF DAVID J. BERTEAU, PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE, PRODUCTION AND LOGISTICS

Mr. BERTEAU. Thank you, Mr. Chairman and members of the subcommittee. I am glad to be here this morning.

Production and logistics in OSD has responsibility for transportation policy, and it is in that capacity that I appear before you today. We also keep a close eye on a number of other things, such as production of weapon systems and the transition from development to production. And in that context, we look, for example, very carefully at what is happening with the C-17. And I want to echo General Johnson's comments on the progress that we have seen with Douglas.

And we care about the industrial base, both in terms of overall defense industrial base capacity and in terms of mobilization requirements. So, in a variety of ways, we approach this in terms of our strategic lift programs and requirements.

Within the Department of Defense we have completed our initial assessments of both airlift and sealift requirements to meet most likely national security threats. But, while these assessments may change as a result of future developments, and particularly as we further define force structure, which is one of the critical unknowns still in this, we are attempting to design into our mobility programs a sort of a multilevel response capability, if you will, that will give us the maximum flexibility to meet a variety of requirements.

And particularly, will also give us a hedge should the future not turn out to be quite as rosy as we now think it is.

Mr. Chairman, you and the members of the Subcommittee are certainly aware and have strongly supported our Nation's airlift capability, military and civilian. Both our internal organic airlift fleet, the C-130s, the C-141s and the C-5s, of course have performed nearly flawlessly in all their service to the Nation here. They have met every challenge, whether it be response to disaster or famine or combat or deterrence.

And we feel very strongly that our capability is very good there. But one of the mainstays of our organic airlift fleet, the C-141, as you noted, is rapidly approaching the end of its useful life. It is costing us more and more to maintain, and that is going to continue to be the case.

The C-17 is highly versatile. It is more capable. It is the most cost-effective option, obviously, for replacing the C-141. You have heard the Secretary's views on that in the results of the major aircraft review, and his proposal to build the 120 of these aircraft over the next few years, and to maintain our current airlift capacity. And in the context of that, retiring the C-141 and saving some money in terms of overall operating costs.

We also completed an initial estimate of our sealift requirements. General Johnson mentioned a bit on this. Clearly, we need the right kind of sealift. We need it early to deploy the major mechanized and armored forces, and we need it over the long term to sustain the force once deployed.

Our sealift assessment was accomplished in support of a task force that was established to develop measures to implement the President's national security sealift policy that he signed last October. This task force addressed not only the actions and issues in that policy, but a number of additional questions. We are in the process of making recommendations from that task force to the National Security Council's Policy Coordinating Committee on Emergency Preparedness and Mobilization Planning.

The task force found that maritime prepositioning ships, the afloat prepositioning ships, the fast sealift ships, and 142-ship Ready Reserve Force, or the RRF, would be essential as a minimum to being able to carry out a rapid reaction force deployment mission in support of a major regional conflict. And in many cases here, I would point out that the long driver in terms of what our requirements would be is not a scenario where we have allied support and we are looking at deployment to Europe. It is a scenario where we are acting on our own over extended distances in a major regional conflict where in fact we do not have the alliance support structure, including the lift capability.

My statement goes into considerable detail in support of all of those elements, with some particular focus on the RRF. Last year, the maintenance of the Ready Reserve Force suffered from a reduction in funding. Only $89 million of the $239 million requested by the Department of Transportation was actually appropriated. That lower level both precluded our planned expansion of the fleet, in terms of additional ships that we wanted to add to it, and it also forced us to degrade the condition of readiness that we keep the fleet in. It did not allow us to do the kinds of preparation maintenance and exercises that we would like to have.

This year Transportation is requesting $225 million. That request is in the 054 budget line this year as part of the national security package. And we urge your support for that. It will help us achieve the goal that is implicit—or explicit within our minimum requirements.

Clearly, we also need to maintain a viable U.S.-flag fleet, a commercial fleet of modern container and multipurpose ships, container, roll-on/roll-off ships, et cetera. And our task force will be making recommendations to the Policy Coordinating Committee for keeping this fleet competitive. Because we feel that that is the best way that our requirements can be met is with a competitive U.S. national commercial position.

In summary, Mr. Chairman, we believe the airlift and sealift programs that we have structured are reasonable in terms of cost and in terms of their ability to meet possible threats. We recognize that those tradeoffs always lead us to be a little further away from the minimum risk that we would like to be able to assume there. But we minimize the investment in the expensive organic assets that actually belong to and are operated by DOD. We plan to rely on commercial transportation capabilities whenever they can do the job in a cost-effective way.

We solicit the continuing support of this committee for both the airlift and sealift programs necessary to meet our unique military requirements, as well as for those measures necessary to keep viable commercial air and ocean carrier fleets that are so essential to our national security needs.

Mr. Chairman, I will stop there and ask that my full statement be submitted for the record. And we stand ready to respond to your questions.

[The prepared statement of Mr. Berteau follows:]

STATEMENT OF

MR. DAVID BERTEAU

PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE

(PRODUCTION AND LOGISTICS)

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE, I WELCOME THIS OPPORTUNITY TO REPORT TO YOU ON THE PROGRESS THE DEPARTMENT OF DEFENSE HAS MADE IN REALIGNING ITS STRATEGIC MOBILITY OBJECTIVES AND PROGRAMS. OUR MILITARY FORCE PROJECTION CAPABILITY MUST BE ABLE TO RESPOND TO THE FULL SPECTRUM OF POTENTIAL CONTINGENCIES IN THE DECADE OF THE 1990'S.

WE HAVE COMPLETED INITIAL ASSESSMENTS OF THE AIRLIFT AND SEALIFT REQUIRED TO MEET THE MOST LIKELY NATIONAL SECURITY THREATS. I MUST EMPHASIZE, HOWEVER, THAT THESE ASSESSMENTS MAY CHANGE AS A RESULT OF FUTURE DEVELOPMENTS AND AS WE FURTHER DEFINE FORCE STRUCTURE IN LIGHT OF CONVENTIONAL FORCES EUROPE NEGOTIATIONS. WE HAVE ATTEMPTED TO DESIGN INTO OUR MOBILITY PROGRAMS A MULTILEVEL RESPONSE CAPABILITY AND MAXIMUM FLEXIBILITY TO EXPAND, IF NEEDED, TO MEET THREATS ASSOCIATED WITH THE THIRD WORLD, AS WELL AS A HEDGE SHOULD CONVENTIONAL FORCE REDUCTION NEGOTIATIONS FAIL.

COST REDUCTION HAS ALSO BEEN A MAJOR OBJECTIVE OF OUR MOBILITY PROGRAM RESTRUCTURING. WE HAVE ACCOMPLISHED THIS BY REDUCING INVESTMENT IN ORGANIC STRATEGIC MOBILITY PROGRAMS AND BY CONTINUING TO PLACE HEAVY RELIANCE ON THE

PRIVATE SECTOR FOR TRANSPORTATION ASSETS. IN A MAJOR CONTINGENCY REQUIRING MOBILIZATION, HALF OF OUR AIRLIFT AND TWO-THIRDS OF THE SHIPS MUST COME FROM COMMERCIAL CARRIERS. IT IS ESSENTIAL, HOWEVER, THAT WE MAINTAIN IN THE ORGANIC MILITARY FORCE THOSE AIRCRAFT AND SHIPS REQUIRED TO MEET THE VERY EARLIEST, CRITICAL FORCE DEPLOYMENTS THAT MOST OFTEN DECIDE THE OUTCOME OF A MILITARY ENGAGEMENT OR CAN DETER WAR. ORGANIC MILITARY ASSETS ARE ALSO NEEDED TO AIRLIFT MILITARY EQUIPMENT THAT IS OUTSIZE, CONDUCT SPECIAL OPERATIONS, AND MAINTAIN THE SECURITY OF HIGHLY SENSITIVE OPERATIONS SUCH AS THE RECENT DEPLOYMENT TO PANAMA. IN LIMITED CONTINGENCIES NOT INVOLVING MOBILIZATION, SECURITY, ECONOMIC AND POLITICAL CONSIDERATIONS COULD PRECLUDE SIGNIFICANT RELIANCE ON PRIVATE SECTOR TRANSPORTATION RESOURCES.

I AM SURE MR. CHAIRMAN, THAT YOU AND THE MEMBERS OF THIS SUBCOMMITTEE ARE WELL AWARE OF THE VALUE OF OUR NATION'S AIRLIFT CAPABILITY—BOTH MILITARY AND CIVILIAN. THE ORGANIC AIRLIFT FLEET—OUR C-130S, C-141S, AND C-5S HAVE PERFORMED NEARLY FLAWLESSLY IN SERVICE TO THIS NATION. THESE AIRCRAFT AND THEIR CREWS HAVE MET EVERY CHALLENGE, WHETHER IT BE IN RESPONSE TO DISASTER, FAMINE, COMBAT, OR TO DETER WAR. THE LONG-RANGE TRANSPORTS OF THE MILITARY AIRLIFT COMMAND ARE ESSENTIAL TO OUR ABILITY TO DETER MILITARY ADVENTURISM AGAINST U.S. NATIONAL INTEREST AROUND THE WORLD.

HOWEVER, ONE OF THE MAINSTAYS OF OUR ORGANIC AIRLIFT

FLEET—THE C-141—IS RAPIDLY APPROACHING THE END OF ITS USEFUL LIFE. THE HIGHLY VERSATILE AND MORE CAPABLE C-17 IS THE MOST COST-EFFECTIVE OPTION FOR REPLACING THE C-141 AS IT IS RETIRED FROM THE FLEET. THE C-17 CAN TRANSPORT OUTSIZE EQUIPMENT THAT ONLY THE C-5 CAN NOW TRANSPORT AND HAS DOUBLE THE OVERALL CAPACITY OF A C-141. IF WE BUILD 120 OF THESE AIRCRAFT OVER THE NEXT SEVEN YEARS, WE CAN MAINTAIN OUR CURRENT AIRLIFT CAPACITY AND RETIRE THE C-141, A LESS CAPABLE AND MORE EXPENSIVE AIRCRAFT TO OPERATE, ALL WITH SUBSTANTIAL SAVINGS OVER THE CURRENT PROGRAM.

BY MAINTAINING THE EXISTING AIRLIFT CAPACITY, ENHANCED WITH THE C-17 AIRCRAFT, WE WILL BETTER BE ABLE TO MEET THE EXPECTED AIRLIFT REQUIREMENTS OF THE EMERGING STRATEGIC ENVIRONMENT. THE ENHANCED FLEET WILL IN FACT BE SIGNIFICANTLY MORE FLEXIBLE WITH THE C-17.

SUBSEQUENT TO THE MAJOR AIRCRAFT REVIEW, WE ALSO COMPLETED AN INITIAL ESTIMATE OF OUR SEALIFT REQUIREMENTS. ALTHOUGH SEALIFT CANNOT MATCH THE RAPID REACTION CAPABILITY OF AIRLIFT, THE RIGHT KIND OF SEALIFT MUST BE AVAILABLE EARLY TO DEPLOY MAJOR MECHANIZED AND ARMORED FORCES AND TO SUSTAIN A FORCE ONCE DEPLOYED.

THE SEALIFT ASSESSMENT WAS ACCOMPLISHED IN SUPPORT OF A DOD NATIONAL SECURITY SEALIFT STRATEGY TASK FORCE ESTABLISHED TO DEVELOP MEASURES IMPLEMENTING THE NATIONAL SECURITY SEALIFT POLICY APPROVED BY THE PRESIDENT IN OCTOBER

1989. THE TASK FORCE WAS CHAIRED BY THE OFFICE OF THE SECRETARY OF DEFENSE AND INCLUDED REPRESENTATIVES OF THE NAVY, ARMY, JOINT STAFF, U.S. TRANSPORTATION COMMAND, MARITIME ADMINISTRATION, AND THE OFFICE OF THE SECRETARY OF TRANSPORTATION.

THE TASK FORCE ADDRESSED THE ACTIONS AND ISSUES IDENTIFIED IN THE NATIONAL SECURITY SEALIFT POLICY PLUS ADDITIONAL ISSUES IDENTIFIED BY THE TASK FORCE MEMBERS. AS DIRECTED BY THE PRESIDENT IN THE OCTOBER SEALIFT POLICY STATEMENT, A NUMBER OF RECOMMENDATIONS WILL BE MADE TO THE NATIONAL SECURITY COUNCIL'S POLICY COORDINATING COMMITTEE ON EMERGENCY PREPAREDNESS AND MOBILIZATION PLANNING. I WOULD LIKE TO PROVIDE YOU A BRIEF SUMMARY OF THE TASK FORCE'S MOST SIGNIFICANT FINDINGS.

AS I HAVE ALREADY POINTED OUT, SEALIFT MUST BE AVAILABLE EARLY TO MEET THE HEAVY FORCE DEPLOYMENT REQUIREMENTS OF A MAJOR CONTINGENCY. THE TASK FORCE FOUND THAT THE MARITIME PREPOSITIONING SHIPS, THE AFLOAT PREPOSITIONING SHIPS, THE FAST SEALIFT SHIPS, AND A 142-SHIP READY RESERVE FORCE OR RRF WOULD BE ESSENTIAL TO CARRYING OUT THE RAPID REACTION FORCE DEPLOYMENT MISSION IN SUPPORT OF A MAJOR REGIONAL CONFLICT. FOR A MOMENT, I WOULD LIKE TO FOCUS ON THE READY RESERVE FORCE--THE MAINSTAY OF OUR UNITS DEPLOYMENT CAPABILITY. THIS FLEET IS CURRENTLY MADE-UP OF 96 SHIPS THAT ARE MAINTAINED AT LEVELS OF READINESS SUFFICIENT TO PERMIT ACTIVATION WITHIN 5, 10, OR 20 DAYS. THESE SHIPS

SHOULD NOT BE CONFUSED WITH THE OLDER, SIGNIFICANTLY LESS READY SHIPS MAINTAINED IN THE NATIONAL DEFENSE RESERVE FLEET OR NDRF WHICH CAN BEST SERVE AS ATTRITION FILLERS IN A PROTRACTED CONFLICT.

THE RRF CONTAINS BREAKBULK SHIPS, ROLL-ON/ROLL-OFF SHIPS, CRANE SHIPS SPECIALLY MODIFIED FOR OPERATIONS IN UNIMPROVED PORTS, HANDY SIZE PRODUCT TANKERS, AND BARGE CARRIERS THAT ARE CRITICAL TO MILITARY OPERATIONS BUT OFTEN UNECONOMIC IN MODERN COMMERCIAL OPERATIONS. WHAT LITTLE CAPABILITY OF THIS TYPE THAT IS AVAILABLE IN THE COMMERCIAL FLEETS IS RAPIDLY DISAPPEARING. THESE SHIPS DO NOT COMPETE IN ANY WAY WITH THE ACTIVE U.S.-FLAG FLEET AND IT IS ESSENTIAL THAT THEY BE PRESERVED IN THE READY RESERVE FORCE.

LAST YEAR, MAINTENANCE OF THE READY RESERVE FORCE SUFFERED FROM A CUT IN FUNDING. ONLY $89 MILLION OF THE $239 MILLION REQUESTED BY THE DEPARTMENT OF TRANSPORTATION WAS APPROPRIATED. THIS FUNDING LEVEL NOT ONLY PRECLUDED FLEET EXPANSION BUT WILL RESULT IN DEGRADATION IN THE READINESS OF THE FLEET. THIS YEAR, DOT IS REQUESTING $225 MILLION FOR UPKEEP OF THE FLEET AND TO ADD FIVE ADDITIONAL SHIPS. THE GOAL IS 142 SHIPS BY 1994.

TODAY, THE RRF PROVIDES ABOUT ONE-FOURTH OF ALL U.S. STRATEGIC SEALIFT CAPACITY AND OVER HALF OF OUR CAPABILITY TO MOVE MILITARY UNIT EQUIPMENT BY SEA. THE DOD SEALIFT TASK FORCE HAS VALIDATED THE CRITICALITY OF THIS FLEET TO

NATIONAL SECURITY. WE SOLICIT THE SUPPORT OF THIS COMMITTEE FOR THE FULL RRF BUDGET REQUEST.

THE DOD SEALIFT TASK FORCE ALSO FOUND THAT THE RESUPPLY AND AMMUNITION REQUIREMENTS OF A MAJOR CONTINGENCY COULD ONLY BE MET IF WE MAINTAIN A VIABLE U.S.-FLAG FLEET OF MODERN CONTAINER AND MULTIPURPOSE CONTAINER/ROLL-ON/ROLL-OFF SHIPS. OUR ANALYSIS INDICATES THAT IF NO ACTION IS TAKEN TO STEM THE RAPID DECLINE IN THE U.S.-FLAG DRY CARGO FLEET, IT COULD BE INCAPABLE OF MEETING CURRENT MILITARY SUSTAINMENT REQUIREMENTS BY 1995 AND, EXCEPT FOR SHIPS OPERATING IN THE DOMESTIC TRADES, COULD PRACTICALLY DISAPPEAR BY 2006. WE FULLY SUPPORT DOT IN THEIR EFFORTS TO RESTRUCTURE SUPPORT PROGRAMS FOR THE U.S.-FLAG FLEET. THE DOD TASK FORCE WILL BE MAKING RECOMMENDATIONS FOR KEEPING THIS FLEET COMPETITIVE AND MINIMIZING GOVERNMENT SUPPORT COSTS.

ONE MAJOR BENEFIT OF A VIABLE U.S.-FLAG OPERATING FLEET THAT IS OFTEN OVERLOOKED IS EXTRA CREWS. EVERY OPERATING SHIP CAN SUSTAIN AT LEAST TWO CREWS. IN A CRISIS, THESE EXTRA CREWS CAN BE EMPLOYED IN MANNING RRF AND OTHER RESERVE SHIPS. IN FACT, AS THE SIZE OF THE ACTIVE FLEET DECLINES, WE ARE CONCERNED THAT BY THE LATE 1990'S WE MAY NOT HAVE ENOUGH CREWS WITH THE RIGHT SKILLS TO MAN RESERVE SHIPS. FOR THIS REASON, WE ARE MAKING SOME RECOMMENDATIONS TO DOT DIRECTED AT REVITALIZING THE MARITIME RESERVE PROGRAM SO THAT IT WILL PROVIDE ENOUGH MARINERS WITH THE RIGHT SKILLS IN A CRISIS. WE BELIEVE THIS CAN BE DONE AT LOW COST BY

RELYING ON THE EXISTING STATE AND FEDERAL MARITIME ACADEMIES AS THE NUCLEUS OF THE PROGRAM.

IN SUMMARY, WE BELIEVE THE AIRLIFT AND SEALIFT PROGRAMS WE HAVE STRUCTURED ARE REASONABLE, BOTH IN TERMS OF COSTS AND THEIR ABILITY TO MEET POSSIBLE THREATS. WE HAVE MINIMIZED THE INVESTMENT IN EXPENSIVE ORGANIC ASSETS AND PLAN TO RELY ON COMMERCIAL TRANSPORTATION CAPABILITIES WHEN THEY CAN DO THE JOB AND ARE COST EFFECTIVE. WE SOLICIT THE SUPPORT OF THIS COMMITTEE FOR THE DEDICATED ORGANIC AIRLIFT AND SEALIFT PROGRAMS NECESSARY TO MEET UNIQUE MILITARY REQUIREMENTS AND FOR THOSE MEASURES NECESSARY TO MAINTAIN VIABLE COMMERCIAL AIR AND OCEAN CARRIER FLEETS THAT ARE RESPONSIVE TO NATIONAL SECURITY NEEDS.

RECENTLY, THE SECRETARY OF DEFENSE RELEASED A DOD TRANSPORTATION POLICY WHICH IS SPECIFICALLY DIRECTED AT FOSTERING A STRONG NATIONAL TRANSPORTATION SYSTEM WITH THE PROPER MIX OF MILITARY AND COMMERCIAL TRANSPORTATION RESOURCES TO MEET DEFENSE REQUIREMENTS. OUR AIRLIFT AND SEALIFT PROGRAMS ARE IN KEEPING WITH THE SPIRIT OF THAT POLICY.

THIS CONCLUDES MY STATEMENT. I WOULD BE PLEASED TO ANSWER ANY QUESTIONS YOU MAY HAVE AT THIS TIME.

Senator **Kennedy**. What I am waiting to hear is how the changes in the European defense needs and requirements, are reflecting from a policy point of view on the matters that are before the committee today. You know, I was trying to think how this testimony would have been different if things had not taken place that have taken place in the last year.

General, do you want to speak to that? Because of what appears to be the reduction in the troop levels in Western Europe, are we going to have to get those troops back if there was some contingency and, therefore, a greater sense of urgency for the C–17 but you will have more time for slower sealift? What are you doing in terms of shifting resources, the research of those areas? What has changed in the world and how is that reflecting on your command?

General **Johnson**. Well, first of all, sir, as Senator Cohen mentioned earlier, the need for mobility has not necessarily decreased. And, in fact, in some ways it has increased. The difference in the focus has changed somewhat. In the European area we are looking at the increased warning time. We are looking at the effect of prepositioning, if we have to withdraw some of that. But we are also paying more attention to other areas around the world.

We certainly would not expect the same warning time in the Eastern Med or in Southwest Asia as we would expect in Europe. We do not have the prepositioning there.

The overall requirement for airlift has been reevaluated by the Secretary of Defense; but as he mentioned before the full committee, a final evaluation has not yet been determined as far as the total number of C–17s is concerned. The need for the C–17 has not changed. The timing is about the same as it was before. The total number, of course, will be decided later on.

On sealift, we have pushed for fast sealift and we continue to want fast sealift. We continue to push for R&D, research and development, on sealift. We are trying to work the commercial sector. We believe that we currently and in the future will depend, in large measure, on the commercial sector.

As you know, we have eight fast sealift ships that the U.S. Navy owns that work very, very well. At one point we thought about buying more of those, but at the current time we believe that the commercial ships will provide the speed necessary. We have the fleet that Mr. Berteau talked about, the RRF, which we want to increase to 142 ships by 1994. But above that we would like to rely on the commercial sector. We believe that is where the future lies in sealift.

Mr. **Berteau**. Mr. Chairman, if I could make three points in response to your immediate question: what has changed and why are you not getting a specific—and I see that you are seeking a specific comment there.

Senator **Kennedy**. I would hope to hear you out before getting into the details of various programs. Sea and airlift needs are different in Western Europe for these reasons and resupply. So, therefore, we all understand that it is going to take some rethinking, but that is taking place. The potential need in terms of the Russian movement down through the Middle East has perhaps changed. Still, you have got uncertainty in terms of the Gulf; that has not changed. What is happening in other strategic areas of the world and how we are reflecting it?

We know that you cannot ratchet on, turn on and turn off the building and construction of ships. But I was trying to hear your assessment as the commander, in terms of air and sealift, and also reviewing what has happened from a strategic point of view, to get some of your thinking about how this is going to reflect itself in terms of the needs for our national security.

Maybe I am missing something. We get back to the flow line, the numbers—we all understand the need for the C–17. We are going to support it. There may be some different needs, such as why it ought to be faster or slower. You get into the issue of the delivery time and whether or not they have met other kinds of benchmarks, all of which are important.

I was trying to get to your assessment of this as the spokesman for sea and airlift, and your assessment of what has happened in terms of the changed conditions. No one is saying that we do not have dangers in the world, or that we are not going to have to deal with the increasing restlessness in the Middle East. That is going to impose an important security element. It is going to require certain kind of assets. Maybe they are the same ones.

I was trying to get at least some kind of sense and feel from you about how the changes in the U.S./Soviet relationship have reflected themselves in the types of air and sealift needed.

Mr. **Berteau**. If I could tie three specific comments to that. One, as you noted in your opening statement, the situation in Europe has changed dramatically. There are somewhat offsetting effects of that, number one being that, in fact, we do have longer warning times; that gives us a longer time to plan and execute lift. That does affect our lift requirements and the mix of lift between air and sea and prepositioning.

But number two, in fact, we will not have nearly as much over there; so it affects as well. But if we size our lift requirements solely on Europe, solely on the scenario of a major conflict in Europe, a major theater conflict in Europe, then we would basically be going down in terms of airlift requirements, for example.

The regional conflicts, you pointed out, have not changed. In fact, they have. But the way in which they have changed is only to become worse. The forces that we are likely to face in a non-European regional conflict are dramatically stronger than they would have been, say, a decade ago. And the warning times that we are likely to face there are dramatically lower. Our ability to predict and to be prepositioned is very minimal there.

So, the requirements that we have there are not substantially lower than we have today. In fact they have not gone down at all.

We can posit scenarios that will drive requirements far beyond our capability to ever pay for them. We can sit here and postulate those kinds of scenarios. We are trying to balance the cost and the resources that we have available with what is in there.

Senator **Kennedy**. Senator Cohen?

Senator **Cohen**. Let me just follow up on the issue Senator Kennedy is raising, concerning strategy on the part of the military at this time. Assuming there has been a reduction in the tensions between the Soviet Union and the United States, and assuming we are going to see substantial reductions in forces in Western Europe, what does this do in terms of your planning and strategy?

What are the areas that we will have to focus on? How much do we anticipate will be required for lift to reinforce Europe, that now more remote contingency that we would have to reinforce Europe? How does your strategy shift toward the Middle East? What are the prepositioning requirements that you anticipate we will need?

Will the United States remain a part of NATO? Will NATO continue to exist for the foreseeable future as an institutional organization that has a strong military component?

Will we have an ability to preposition large numbers or tons of equipment in Europe? If not, where do we go?

I think that is what Senator Kennedy is looking for. It may shift. As I indicated, we might need more. I do not know how long we will be in South Korea. I do not know how long we will be in the Philippines. I do not know what that will do in terms of prepositioning.

Are we going to be left with Diego Garcia as our only spot in the Indian Ocean? These are the kinds of questions that I think we have to face in terms of justifying lift requirements. To say that we have perhaps more than we have had in the past is not going to be sufficient. We need to know a little bit about the thinking that is going on within the Department of Defense.

General JOHNSON. I will defer to Mr. Berteau on the Department of Defense, but I will handle some of the other parts.

In prepositioning, we are quite fortunate we have a couple of types of afloat prepositioning. Number one, we expect to keep the prepositioning in Europe. All the negotiations seem to imply that that will stay.

We have two types of afloat prepositioning. With one type, the Maritime Prepositioning Ships, the Marines have the capability to handle a full Marine expeditionary force, equipment-wise, afloat. These are divided into three squadrons, a brigade in each one. There are four to five ships in each squadron. One squadron is at Diego Garcia, one is at Guam/Tinian, and the third one is in the Atlantic. We can fly the Marines and the offloading equipment to close on these ships any place in the world.

We also have 12 ships in afloat prepositioning. These are primarily sustainment type activity. One is a hospital ship, four are petroleum tankers, and the others are Air Force and Army sustainment type—bombs, rations, and so forth. They are primarily in Diego Garcia.

Senator COHEN. If I could just interrupt for a moment. What we are looking for is whether or not there is some thinking under way within the Pentagon that is reflected in the budget request for the various equipment that we are called upon to fund that would indicate, for example, that we are going to rely more, relatively, on airlift and sealift than on prepositioning.

Is it realistic to assume that we are going to have less ability to preposition large quantities of equipment and stocks and supplies to areas that are closer than the United States, i.e., Europe? Or are we going to have to have greater sealift and airlift to fly and to sail to more remote regions of the world?

You indicated in your opening remarks that you were quite pleased with the situation; the airlift performed well in Panama. Well, Panama is pretty close by. What I am asking is how would the C-141s perform flying to the Persian Gulf, or flying to very distant regions having to carry that kind of equipment? Those are the kinds of things we are looking at. Current airlift capability may be fine for Panama. Is it going to be fine for another part of the world? And is that a part of the world where we will have less prepositioning available to us?

I do not need to get into specifics of what kinds of ships you have available right now, but rather, what is the strategy? What are you thinking of in terms of the potential future requirements as we shift away? Rather than looking mostly to Europe, are we now looking to other regions? We are going to have to have fewer of whatever we are requesting; we see that with the C-17, but we will have to have modern aircraft and modern ships.

Tell us what you see for the foreseeable future in terms of our requirements. I think that is basically what we are trying to find out.

Mr. BERTEAU. Senator Cohen, in terms of the fiscal year 1991 budget, if I may, in all three of those areas, sealift, prepositioning, and airlift, there is clearly nothing in our assessments of the changing nature of the world and the requirements that would lead us to believe that we have an excess amount of money in any of those three categories in the fiscal year 1991 budget proposal with the exception of the C-17 scaling down to two for fiscal year 1991 as opposed to six. And that is driven, not so much by a diminishing airlift requirement as it is a look at the concurrency and the production capability associated with that to put us in a better position to produce that aircraft.

Senator COHEN. Well, you better start with a proposition then, that we at this particular point cannot possibly even meet the Congressionally Mandated Mobility Study, which said we had to have 66 million ton-miles per day. We cannot meet that now.

What you are saying is that even though the circumstances have changed in Europe, that was a figure that we were not even close to to begin with, right?

Mr. BERTEAU. That is correct.

Senator COHEN. Now, go beyond the next fiscal year, because that is what we are going to have to do.

You are saying that there has been no significant change in the planning, notwithstanding what is taking place in Europe, because we still need these forces at a minimum.

Mr. BERTEAU. You raised a number of extremely difficult questions in your opening comments, some of which we can answer, some of which we cannot.

I would like to add to that three additional questions which were implicit in yours. One is the size of the force structure that results and that you would see in the 1992 budget. The second is the disposition of that force structure in terms of where it is located. And the third is the force mix contained within that force structure in terms of what is in the Active force and what is in the Reserves. Those are all key, essential elements of the equation that produces the lift requirements at the end.

Senator COHEN. Senator Kennedy is saying that we do not see any attempt at this particular point—there may be an attempt, but we do not see any evidence of what is going on within the Pentagon—to reflect those kinds of policy decisions, or at least examinations.

Mr. BERTEAU. That is a very fair comment. The way in which we prepare, of course, our 1992 to 1997 6-year program is we generally sort of do that inside the building first. Then, once we have reached some conclusions, we come and lay them out.

Senator COHEN. We are going to have a problem. We are going to go to the floor of the Senate and say, "Well, there are vast changes and there is not anything in this budget that reflects those kinds of changes." What we are suggesting is that there ought to be some kind of testimony which reflects the different analysis that is going on in the Pentagon saying, yes, this has changed in Europe, but this is what we need elsewhere, and the reasons for it. It simply is not yet reflected in the testimony.

Mr. BERTEAU. Maybe I am misunderstanding. But it seems to me that what you are saying is that you are concerned that, in fact, the fiscal year 1991 requirements would be less and that we would have a hard time defending what is in the 1991 budget.

Senator COHEN. What I am saying is, the fiscal year 1991 request seems to simply reflect what we have done in the past. There is going to be a difficult job for us to defend the defense budget on the floor unless we can show that, yes, the budget is starting to reflect a changing analysis of what our strategy and goals have to be for the future.

Mr. BERTEAU. And what I am suggesting is that almost any set of answers to the questions that you and the Chairman proposed would lead us to at least that much. Maybe we need to give you some additional justification to assist you in defending that position.

Senator KENNEDY. Our time is up. This does not have to be a confrontational aspect. There could be a continuing flowline. You are going to find that these things are going to be adjusted and changed as it goes. There are going to be additional kinds of review and thinking. However, it is more important for us to be in contact, with you letting us know how it is developing as you move ahead on it.

I think all of us understand. I think your point is you are going to need these basic kinds of needs under any circumstance. The idea that there is evolving and thinking this thing through and that this thing is moving along is completely understandable.

Senator Exon?

Senator EXON. Mr. Chairman, thank you very much. Gentlemen, welcome. I have been listening to the discussion here. Let me see if I can lead you back to some questions that I have, questions that this subcommittee and the Armed Service Committee as a whole has of where we are going in the future.

You know, I may be wrong, but I happen to think that we are still emphasizing too much concern in Europe. If there is one thing that is clear now, it is that there has been a significant reduction (and I mean major, significant reduction) in the chances of a conventional clash in Europe for lots of reasons, not the least of which has been that the demise of the autocratic control by the Soviet Union over all their satellite nations is gone. Therefore, the immediate threat of a sudden outbreak of conventional war in Europe is all but gone, as far as we can see into the future now.

I think most of us in this room, and I suspect most of the people in the Pentagon and I hope in the White House, really feel that we better be looking to shape our national security policies on what is the next most likely scenario.

I suspect, and I hope it is not true, but I suspect, that most people would believe that the next flashpoint is likely to be somewhere in the Middle East, given all the problems that we have there. That covers a very broad range of difficulties.

Given that, then sealift and airlift are tremendously important. Let's forget Europe for a moment; we cannot forget it forever, but let us forget it for the moment. I believe that we should be preparing for our national security interest as to what we are going to do in other parts of the world. Therein lies the dedication of this subcommittee and the committee as a whole for a long, long time to improve airlift and sealift.

We are going to be pulling more troops out of Europe obviously than even the administration has thus far evidenced. It is an indication that things have changed over there very dramatically.

Let us talk about prepositioning for just a moment, if I might. Where, other than Diego Garcia, do we have any significant deployment of prepositioned supplies in the Middle East?

Specifically, let me ask you about Israel. Do we have any significant prepositioning of material in Israel, especially in Haifa Port? What is the situation there and what can you tell us about that in open session?

General JOHNSON. I cannot address that, prepositioning in Israel. That is not in my area of expertise and I have no knowledge on that issue.

Senator EXON. How about you, Mr. Secretary?

Mr. BERTEAU. I am not aware of anything, sir. I could check on that and provide you something for the record, either classified or unclassified.

[The information referred to follows:]

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

Senator EXON. Where, other than Diego Garcia, as mentioned by the Chairman and Senator Cohen, do we have any significant prepositioning in that particular area?

Mr. BERTEAU. Forgetting Europe and not tied to basing structure is the implication I am getting from your question. I do not think there is any place.

Senator EXON. Diego Garcia is it?

Mr. BERTEAU. When you put the term significant and you forget Europe and you make it independent of bases, i.e., Clark Air Force Base, for example.

Senator EXON. That is a pretty sad picture. It shows more than anything else how important, I think, this whole matter of airlift and sealift is.

Why is it, Mr. Secretary, that despite the efforts—and I can go back several years in this subcommittee and this committee—we have always been putting more money into fast sealift than the administration has wanted? Even as of right now, I believe, is it not true, Mr. Secretary, that the administration has suggested redistribution in some form of even the $15 million that the subcommittee and the committee as a whole had put into fast sealift. It seems to me that you are downgrading the sealift at the very time that most of us think the sealift is critically important if we address the future of low intensity conflict.

Mr. **Berteau**. Mr. Exon, we certainly agree that, in fact, sealift is critical. We are going to spend that $15 million on the fast sealift R&D or at least whatever we can obligate and expend this year, that being 2-year money, it will survive and carry on. We clearly believe that sealift is critical.

The question is a broader one than that in how do you spend what dollars you have so that you get the maximum amount of sealift for it. The concern we have had with the commitment to the fast sealift is that that commitment is made, if you will, without sufficient connection to some of these unanswered questions and evolving scenarios there.

We do have prepositioning capability that is afloat that we can move to areas ahead of time if we have warning. We have a considerable capability already with all of our sealift ships, but you have to make some assumptions in terms of how we are going to use them and in what kind of time frame.

I might also point out, in other appearances before other subcommittees and committees here on the Hill, I have not been encouraged by the support of the Congress for, in fact, keeping U.S. forces overseas at various installations which would obviously reduce our lift requirements.

We are very sensitive to the fact that our lift requirements, both sea and air, are going to be affected negatively by the withdrawal of troops from those places where we are forward deployed. That is going to be a fact of life. Where, when, and how fast, we are not sure.

But we have to be very careful that we get the maximum amount of lift for the dollars that we spend, because we do not have an infinite amount of dollars to spend on lift.

Senator **Exon**. It seems to me, Mr. Secretary, that when you and I both seem to agree, we are going to be pulling more troops out of more places, especially Europe. Once again, we keep coming back to that.

I am most concerned, as I hope you people are, about what I think are the potential flashpoints in places where, other than Diego Garcia, we are pretty naked right now. I think we had better try to work together, not in a position of being adversaries, but in a position to be realistic.

We have had a weak sealift capacity for a long, long time. All too often we talked about sealift with regard to supplying Europe in case of an attack. I think we are woefully weak even if we did not have to worry about Europe at all. And certainly, I think Europe is not the immediate concern as far as the next ten years is concerned.

Thank you. My time is up, Mr. Chairman.

Senator **KENNEDY**. Senator McCain.

Senator **MCCAIN**. Thank you, Mr. Chairman.

I will not resonate the dissatisfaction that has already been displayed here. I will just say that I also am concerned. I think Senator Cohen and Senator Kennedy said if we go to the floor without some articulation of a strategy, we are going to have very great difficulty defending the proposals that you are making here today and that the Department of Defense will make.

I would ask that my prepared statement be made a part of the record.

Senator **KENNEDY**. It is so ordered.

[The prepared statement of Senator McCain follows:]

PREPARED STATEMENT OF SENATOR JOHN MCCAIN

Mr. Chairman: The time has come for a fundamental rethinking of our requirements and budgets for strategic lift. For more than a decade we have had requirements we could never really hope to fund to move forces we could never really hope to make ready.

We have pursued the myth of trying to provide 10 divisions to NATO in 10 days, although we have had ample testimony to show that the forces involved lacked the readiness, sustainability, and prepositioning that would be required, and were—in fact—a hollow army.

This year we face an even more serious challenge. We all know we are going to have to cut our Active force structure by at least 25 percent over the next 5 to 6 years. We are talking about an Army with 10–12 active divisions, we are talking about a Navy that may well be under 500 ships, we are talking about an Air Force with roughly one-third less active tactical aircraft, and we are talking about substantial cuts in the Marine Corps.

These cuts require a fundamental rethinking of our requirements for strategic lift. They require major changes in the role and missions of our forces, in the size and nature of the forces to be moved in given contingencies, and in the volume and timing of the supply and reinforcement we can provide.

We need to debate the priority we give to global power projection relative to the priority we give to the reinforcement of NATO. We need to debate the need for retaining forward deployment versus reliance on strategic lift. We need to debate the priority for strategic lift to support combat ready Active forces, and lift for those Active and Reserve forces that take weeks or months to deploy and sustain.

We need to stop looking at theoretical requirements for the maximum air and sea lift that might be needed in worst case contingencies, and to look at the levels of lift needed for a range of contingencies in critical regions of the world.

We also need to approach strategic lift with a new degree of realism. The issue is the lift we can afford for a balanced force that we can really fund. We cannot go on decoupling our examination of strategic lift from sustainability, modernization, and readiness.

Further, I hope today is the last time we will hear about the need for sealift that is not funded in the budget. If the Navy has a priority for sealift, it deserves to be funded—just as it funds amphibious lift.

If the Navy does not feel sealift is worth including in its budget, it should stop talking about it. No one is going to create a real-world sealift program by adding money to the Navy's budgets. We will only have such a program if the Navy is willing to make the necessary trade-offs with other capabilities, and actively seek funding of its requirements.

In short, Mr. Chairman, the real issues we face are not the fiscal year 1991 budget request, but the future need for strategic lift in a world where we must fundamentally rethink our strategy, our roles and missions, and our long terms requirements.

I recognize that we cannot do this today, or during our mark-up of the fiscal year 1991 budget. I recognize that our witnesses can only hint or guess at our future needs. I do, however, hope that they will take account of what I have just said in their mobility and force planning studies for fiscal year 1992 and the current 6-year planning period, and that we will see a very different approach to strategic lift next year.

Senator McCain. Let me talk about the C–17 for a moment. Have you had a chance to see the GAO report that we received on Friday and came this morning?

Mr. Berteau. We have seen it this morning. I think the next panel is better prepared to address that. It was just a quick, cursory reading this morning.

Senator McCain. Well, this is pretty strong language here. Full-scale development of the C–17 began in 1985. The estimated acquisition cost would be $34.5 billion. In 1989 the estimate was raised to $37.5 billion. The most recent estimate is $41.8 billion, an increase of $7.3 billion or 21 percent since 1985.

Mr. Berteau. Those numbers are accurate, but they reflect the previous program of procurement of 210 C–17s.

Senator McCain. So by reducing the size of the buy, are you able to reduce the inflationary factor of 21 percent?

Mr. Berteau. In terms of the overall program cost, it goes down. In terms of the unit cost per aircraft, obviously with fewer aircraft you are not going to get cheaper per unit cost.

Senator McCain. They go on to say that Douglas Aircraft Company's current plans do not show how the deferred work can be completed in time to support the planned June 1991 first flight date. As a result, we believe that it is difficult to predict when the first flight of the C–17 will occur.

General, do you agree with that?

General Johnson. We are confident it will occur on or before June of 1991. Douglas has had difficulties. They have had problems. The government project officers and the auditors, all agree on their get-well plan. We believe that everything they have had since last November when they, in essence, made a new——

Senator McCain. General, have you had a chance to talk to the Air Force plant representative assigned to Douglas?

General Johnson. Yes. I saw them on Friday, had a long visit.

Senator McCain. According to GAO, the Air Force plant representative office believes that Douglas cannot produce the C–17 to either budgeted cost or planned schedule. So the GAO is reporting that the Air Force Plant Representative Office (AFPRO) believes that they cannot produce it on schedule. Are you saying the first flight will take place on time?

General Johnson. I talked to the AFPRO, Colonel Tollefson, on Friday and he thinks they will. There is certainly some risk in making the June date, as in any other program, but Douglas has made tremendous progress. They have closed out a lot of the issues that were raised earlier by the plant representative. I think he is much more confident now than he was, say, 3 months ago.

Mr. Berteau. And, Senator McCain, if I might, and again this is just based on a cursory, quick read-through of that, I believe those comments were in respect to the prior schedule and the prior production schedule that the AFPRO was making those remarks. I think that the schedule which the Secretary has now proposed is one which is more modest in terms of the early expectations and one which everyone feels more comfortable that Douglas will be able to meet the production schedule, as well as the first flight schedule

Senator McCain. Well, I believe the GAO got a different impression because they say the AFPRO believes Douglas does not have the systems in place to effectively manage these areas. He goes on to say that Douglas' lack of cohesive and organized systems—this is the AFPRO, not GAO lack of cohesive and organized systems—result in late drawings, part shortages, late supplier deliveries, and unacceptable quality. The AFPRO believes these are the reasons the C-17 is behind schedule and over budgeted cost.

Douglas is developing plans to address these issues. The AFPRO believes that Douglas cannot produce the C-17 cost effectively, with acceptable quality, and on a predictable schedule until these areas of deficiency are corrected.

You believe all those deficiencies have been corrected; is that right?

General Johnson. I do not believe all of them have been corrected, sir. But I believe he would tell you a different story today.

Senator McCain. I do not know how recently GAO talked with him, but the report is as of today, so it cannot be too long ago.

General Johnson. Douglas has accepted the concerns raised by the AFPRO. And Douglas and the AFPRO have agreed on a resolution of these. They are beginning to be resolved very, very quickly. There are certainly challenges ahead as in any program.

Senator McCain. General, this program was authorized and appropriated in 1985, right?

General Johnson. That is correct.

Senator McCain. Now, in 1990, we are finding that there are serious problems that need to be addressed. And we have every confidence that 5 years later these problems are going to be addressed?

General Johnson. We are talking two different things, sir. In 1985 the program was authorized. Now we are talking about building it and the actual procurement, the actual production is what the AFPRO is raising concerns about.

Senator McCain. The GAO says over the last 2 years the AFPRO has identified problems with manufacturing, software development, quality assurance, scheduling, cost estimating, and subcontractor management. All of those, according to the AFPRO, have been identified over the last two years. But now you are sublimely confident that these problems will be taken care of, and we will have this plane on schedule at cost. Is that accurate?

General Johnson. First of all, what you say as attributed to me is accurate. But let me explain why I come to that conclusion.

Since early this year, the McDonnell-Douglas corporate assets have been put against the C-17. The management at Douglas has changed dramatically. People have come in who have built airplanes before and they are the ones who are correcting the AFPRO concerns.

Mr. John McDonnell, President of McDonnell-Douglas, acknowledges the concerns expressed by the AFPRO and is setting about fixing them as opposed to arguing about if they occur or not. They have gone back to such things as master tools, reinspecting all of those as the AFPRO suggested. The discrepancy reports have been put together and are being worked as opposed to being ignored.

So, I can say with confidence that the Douglas company today can meet those dates. They have met every date they have signed up to since last November when we agreed to a new set of dates.

Senator McCain. When you agreed to a new set of dates? Let me follow up if I could, sir, because I am short of time.

So, General, you believe the first flight will take place in June 1991, correct?

General Johnson. Yes, sir, or before then.

Senator McCain. You believe they will meet the revised production schedule at cost?

General Johnson. I believe they will make the production schedule; I am not an expert on the cost, but I believe they have the capability to meet the schedule.

Senator McCain. What if they do not, General? Should I ask you to come back a year from now if the flight does not take place in 1991? What should we do if it does not?

General Johnson. There are certainly severe financial——

Senator McCain. If we take your testimony here as a witness—and I will accept your word, that is why you have got four stars and that is why you are in the position of responsibility that you are now—what if they do not meet the June 1991 date? What do we do then? Get another witness?

General Johnson. No, sir. We certainly have to work with them as we go along to make sure they meet that date. If they do not meet it, then we have to find out why they have not met it and take corrective action—but not next June, day-to-day as we go along.

Douglas is working, not to milestones, but inchstones. They are working very precisely under close guidance of the government. It is a partnership. If they do not make it, we have a role to play in their not making it because we are watching them day-by-day.

Senator McCain. Who was watching it while the cost estimates went up by 21 percent?

General Johnson. The government was watching it, but many things change cost estimates; the schedule, the production, and so forth.

Senator McCain. Mr. Chairman, my time has expired. Mr. Secretary, did you want to say something?

Mr. Berteau. A couple of things, Senator McCain. Number one, a lot of the cost estimate increases is driven by changes in schedule as well as driven by changes in performance by the contractor or by the subcontractors providing material and parts for this. And much of that is driven by the budget. At the time—if I went back to December of 1985 when we approved the milestone two, the full-scale development of that C–17 and looked at the dollars that were projected to be available, number one, for the whole Department of Defense and, number two, just to the Air Force for the C–17 program versus the dollars that have actually been available to be spent there, that is a factor behind approximately half of that cost increase. The rest of it is, in fact, related to performance by the contractor and so on.

We have looked very carefully at the manufacturing pieces that you mentioned. For example, the problems with the wing we feel have been resolved. There is still a question of mating the wing to the aircraft. It has not been done yet. We think that they are in a position to be able to do it. You have a good wing to put on there now, for example.

Douglas has done a tremendous amount of work in terms of clearing out the additional work in the plants out there and moving it to other locations so that the entire focus of the trained and skilled work force can be put on making the C-17 come to pass.

I am confident that they are going to make the flight.

The cost is being reworked right now because we have a brand-new schedule that the Secretary laid out for the members of this committee back at the end of April. We are working with the contractor on recosting that different procurement schedule. Will it match up with the previous costs? I doubt it.

It will be substantially less in total because you have far fewer aircraft and we will be much more comfortable that—in fact, what those cost estimates are will be closer to reality. But they will be the best cost estimates that we can come up with.

Senator McCAIN. The unit cost will be significantly higher?

Mr. BERTEAU. Unit cost will be higher. I am not prepared to append the word significantly to it until I have seen what they are.

Senator McCAIN. Thank you, Mr. Chairman.

Senator KENNEDY. Senator Dixon?

Senator DIXON. Mr. Chairman, I think this has been a very interesting hearing. May I make this observation?

I certainly am one of those Senators who feels that in view of the sea changes in Eastern Europe, there should be dramatic changes in what we are doing around the globe. I personally feel there should be very, very large force level reductions in Europe, considerably more than we are presently contemplating, and even more than we are talking about in the CFE talks.

I think, in South Korea and all over the globe, there should be very substantial force level reductions. I think to talk about a big investment in Crotone now is a mistake. I think with 1,000 bases, big and little, all over the globe that we are not doing enough to close foreign military bases and that there should be a very substantial and dramatic reduction in foreign bases.

Having said all that, Mr. Chairman, I think that is why it is so important what this subcommittee you are chairing is doing here for the future—because I think the future is sealift and airlift. I think that is what we ought to be directing our attention to in a very significant way. I do support major investments, large and significant investments, in sealift and airlift capability. I think that is the future of the defense strategy of this country.

I would be very interested in hearing the views of you, General Johnson and you, Mr. Berteau, about that possible configuration of what we do in the future.

Mr. BERTEAU. I agree with much of what you said, Senator.

Senator DIXON. Do you want to clarify that? Which portions?

Mr. BERTEAU. Which portions I agree with and which I don't?

Senator DIXON. Probably the last part only, but at least that much.

Mr. BERTEAU. In the interests of time, I do not think we will go into that level of detail.

Clearly the dependence of the country on lift is more visible. It is more clearly visible today than before. We have to be very careful that what we do is match up, in fact, the forces that we are going to have and the places we are going to plan to deploy and move them to. At least in a scenario kind of framework with the lift capability that we have.

That is the big unknown. I mean, that is true, there is a big push to bring forces home. There is also a big push to take them out of the Active force and put them in the Reserves. We have to be very cautious in terms of doing that. If we are planning, for example, on deploying the equivalent of five divisions to some, extensive faraway spot, and be able to sustain those, that we do not plan on too much of that being in the Reserves, because you are either going to have time to get ready to go or you are going to have time to get there, but you are not going to have time to do both.

Those are the kinds of things that we need to clearly lay out. There are too many unanswered questions to be able to sit here today and tell you it is X amount of forces going Y distance and Z amount of time; therefore, this is exactly the number of aircraft you need, number of ships you need in order to do it.

Senator **Dixon**. May I interrupt?

My subcommittee is responsible for working with you and others concerning readiness, and we expect to do that. The point though, at least the narrow point I wanted to make was, no matter what your view might be of what the configuration ought to be of how much the force levels ought to be reduced, I suspect that I want to reduce it a good deal more than you or my friend, General Johnson, or many even in this committee.

But all would agree that the more of it you do, the more that you need to rely upon readiness and sealift and airlift that will get it there in short order wherever the flashpoints in the globe might be. That certainly is fundamental; is it not?

Mr. **Berteau**. That is fundamental. I think the requirements that we have laid out and discussed here, the number of ships in terms of prepositioning ships, in terms of the ready reserve fleet, in terms of the organic sealift capability, the 48 million ton-miles a day, which is the current airlift capability that we seek to preserve with the transition from the C-141 to the C-17, those need to be seen very clearly as minimum requirements for virtually any future that you posit there. I agree with you completely on that.

General **Johnson**. Looking at strategy, and going back to several Senators' earlier comments concerning Europe, we are focusing around the world. I believe the bigger requirements are not going to be Europe, but the Eastern Med, and Persian Gulf, just because of distances.

As I believe Senator Cohen mentioned earlier, Panama is closer to Miami than New York is to Miami. To give another example, we resupplied the Israelis back in 1973. We had a very difficult time. We had only one ally who would give us landing rights, Portugal, at Lajes Air Field. We took on as much fuel in Israel as we delivered cargo. But airlift saved the country. The first ship that arrived had more cargo than all the airlift had carried in before the cease fire, but the cease fire had occurred several days before arrival of that ship.

So, we have to work the distances. We have to work the warfighting CINCs requirements, what they want to carry where, then we can tell you what's required.

From a sealift standpoint, when we look at Europe, we include all the NATO shipping between 400 and 600 ships—we count on 400 out of a 600 ship pool. If we were to go someplace else, we probably would not have those, and that would take away about half of our shipping capability.

Senator DIXON. General Johnson, if I could pursue just a moment longer—and I'm probably about to run out of time—the questions by my friend from Arizona, about which you and I have talked privately. I think I am as enthusiastic a supporter of the C–17 as anybody in the Congress, either House. A good deal of that is by virtue of my friendship and association with you, and with General Cassity and others for whom I have the highest personal regard.

But I continue to be concerned about questions like those emanating from my friend from Arizona, who is certainly a man who is stoutly supportive of an adequate defense system for this country. On two different occasions lately, my friend, the chairman of the committee, Senator Nunn, has expressed concerns about the performance capability of the C–17 as it goes along right now in the development stage. Can you, once more, reassure us about this thing, that you believe this is going to be all right. I understand that Senator Nunn just expressed the other day, again, in my absence in the committee, his concern. Do we have this C–17 in shape now? Will it perform shortly in a way that those of us in this committee can defend it stoutly wherever we go?

General JOHNSON. Sir, I believe that if the American industry, the American economy, and certainly the McDonnell-Douglas Corporation can build the airplane, it will be built on time. The commitment is there from the corporation. It is there from the other companies that support McDonnell-Douglas in this effort. If we are not able to do that, it is an indictment not only of us, but our economy. I am convinced that we can do that.

Now, certainly, McDonnell-Douglas has had their difficulties, as have many industries in our country. Still, I see the commitment by the corporation. I see the leadership in place to do that. I do not know what more good feeling I could give you, other than I have looked, I have talked, I have seen, and I am confident. I am certainly not an expert on the American economy, but if the American economy can do it, McDonnell-Douglas can and will.

Mr. BERTEAU. Senator Dixon, if I could add two things to that. Number one, I am a skeptic by nature, and particularly in terms of my job responsibilities looking at weapon systems going into production, I am paid to be a skeptic. And over the past few years, we have had a host of weapon systems that have made that transition from development to production. Some have made it better, some have made it worse. It is almost never an easy transition, in part, because of the complexity of the systems we buy.

We face a problem with the overall acquisition system, and the overall industrial base in America, and I can understand Senator McCain's frustration. What is our alternative if they do not make it. This is not like hiring, you know, going out to buy a new car and if you do not like what Ford sells, you go across the street to

General Motors or, heaven forbid, to some other supplier, which I will not mention since I grew up in a Ford family.

Senator **Dixon**. We will give Lee Iacocca equal time next week.

Mr. **Berteau**. The problem we face is we frequently do not have alternatives.

But back to the C–17 specifically. One of the very encouraging things to me is that the problems that have been identified as we have been in this transition have stabilized in the sense that there are no new, unknown problems cropping up. And one of the things you start to look for as you are in a difficult transition, and start to smell, is this going to be something like the M–1 where we had problems when we went from transition into production, from development into production. Those got worked out. We eventually wound up with a mighty good tank, and most of the world looks at that and admits it is a mighty good tank, as opposed to, for example, the Sergeant York, which had problems as we went from development into production. We never worked them out, and we wound up having to kill it.

You learn to sort of smell things that are going to go right versus going wrong, and some of the signals you look for are, are the problems stabilizing and are you starting to see the solutions, and are the solutions then causing new problems.

What I see, by and large, with Douglas and the C–17 is in fact, the solutions are not causing new problems. The solutions are solving the problems. The trend is in the right direction. The Air Force, I am sure, is going to be prepared to say a lot more about that when the GAO lays this thing out in your next panel. But, I wanted to, for whatever it is worth, contribute that viewpoint here with respect to the C–17.

Senator **Dixon**. I appreciate that very much. Thank you, General Johnson and Mr. Berteau.

Senator **Kennedy**. Senator Lott.

Senator **Lott**. Thank you, Mr. Chairman. I think you two gentlemen are in an unusual position in your appearance before the committee, because it is one of the few instances where it sounds to me like the Committee would actually like for you to do more. As the circumstances have changed around the world, we have shown a great concern about lift requirements, and I do not think we are getting enough action in that area, from the administration, and I would like to ask two or three questions in that area.

First of all, General Johnson, we have talked about the C–17. You mentioned in your statement concerns about structural problems of the C–141 fleet. You give a little attention to that, but what is the severity of that problem? Are we reaching the end of the life span? What about dealing with those problems and continuing to make use of them?

General **Johnson**. The C–141 was built as a 30,000-hour airplane, and was structurally designed for that. We did several things. One, we stretched it, which did not hurt its life. In fact, we increased its life by another 15,000 hours by doing some work in the wings and other parts of the aircraft. But we also gave it an air refueling capability, partially because of the difficulties with landing rights we encountered during the 1973 Arab/Israeli War. We needed the air refueling capability. We were also required to go low level. Both of these increased the fatigue factors on the aircraft.

We are confident, in fact, we have programs in place, to continue the aircraft to 45,000 hours. If we go past that time, we need to change the wings, the pylons that hold the engines, and the engines—about $13 billion worth of work, and we will still have an old fuselage. The aircraft average hours now are in the 32,000 range. We can shepherd this aircraft for a few more years, up to 45,000 hours. Beyond that, we think we are, in essence, rebuilding the aircraft and still have an old fuselage.

Senator LOTT. During the recent Just Cause operation, a lot of credit was given to our Reserve and National Guard squadrons, and their operations in that effort. Do you foresee the transfer of more of our military airlift from the Active to the Reserve components?

General JOHNSON. Not in the airlift portion. We already have over 50 percent in the Guard and Reserve, and they serve very, very well. About 27 percent of the airlift missions going into Panama were Guard and Reserve missions. Most of those missions occurred after the initial launch. Our problem is in a contingency like that, as you recall, we had a rehearsal. It is very difficult to ask a Guard unit or a Reserve unit to participate in a rehearsal, and then be on standby for some time before we take the mission into execution. So, it is very difficult to use Guard and Reserve in that sort of mission.

In the first flight, as soon as the mission went off, I announced that every available resource should be used, regardless of component, and that worked very, very well. We are very proud of them.

Senator LOTT. Shifting to the sealift capability, you commented during your opening remarks that we are rejuvenating the maritime industry. You are joking, are you not?

General JOHNSON. I said that one of the challenges was to rejuvenate the maritime industry.

Senator LOTT. Well, okay. I think that would be more accurate. In your prepared testimony here, you stated that the fleet has gone down from 894 ships in 1970 to 423 in 1989, a 53 percent reduction. We are looking at the possibility or probability of 200 ships by the year of 2000. I am really concerned about not only the airlift capability, but especially the sealift capability, and these Reserve components you have—or ships, the Reserve ships—I have a lot of doubt about those. Yet, this committee provided $592 million in fiscal year 1990 for building fast sealift ships. What are we going to get out of that?

General JOHNSON. I can address the first part of your question, and I defer the last part to Mr. Berteau.

Certainly, our sealift capability has decreased. I would take exception to your doubt about the Ready Reserve Fleet. I think we can rely on that fleet. We have noticed over the last few years that as we break out ships, we have a higher reliability than we did several years ago. As you know, the Department of Transportation, the Maritime Administration in particular, administers those ships, and through your support, we have been able to maintain those ships a lot better.

As for the older ships in the National Defense Reserve Fleet (NDRF), we do not count on those. It takes between 30 and 60 days to break them out, and they are less useful to us.

Senator LOTT. I understand that these NDRF ships take between 30 and 90 days—and I would appreciate maybe some additional information for the record later on—and that quite often when these Ready Reserve ships are mobilized they are not ready to sail, that there are problems with them, and you use the ones that are ready to sail each year when you have this mobilization. There are real questions about whether or not they are ready to sail.

General JOHNSON. We have had some difficulty in breaking out the RRF ships. In the last time period, we had difficulty with about a third of them. Many of their problems are, in fact, fixable. Some have to do with fuel.

Senator LOTT. Do you have a program to fix them?

General JOHNSON. Yes, sir. The Maritime Administration has a program to fix them, and that's what you have just said.

Senator LOTT. The NDRF ships are really not what you are looking for, and we've only got two-thirds of the Ready Reserve Force that are now really usable.

General JOHNSON. What I meant to say was, we do not count on the NDRF, because they do not come out of activation until after we need them—and although we have some challenges when we bring ships out from the RRF we are able to activate them in a timely manner, put them into operation and exercises, and return them to the RRF.

Senator LOTT. My time has expired, but Mr. Berteau, maybe you would like to comment. You know, I really do not think the administration is officially committed to the fast sealift capability as evidenced by the way that they have dealt with this $592 million for fiscal year 1990.

Mr. BERTEAU. Let me set aside the fast sealift and address the broader question, and then come back to the fast sealift very quickly, if I may, Senator Lott.

I agree with you completely that we need to make sure that the sealift capacity we have is adequate, and that what we are funding is less than what we would like to have if we had unlimited resources. There is no question but that budgetary constraints plays a role in here.

One of the things that you need to do with the Ready Reserve Fleet is, in fact, one of the places where the Administration did propose a substantial increase in the funding over fiscal year 1990, what was appropriated is in terms of MARAD's money to maintain and have that Ready Reserve Fleet ready to go. So, those five, 10 and 20 day ships, when you bring them in, you get above that two thirds level that General Johnson talked about. That is an increase up to $225 million, much of which is, in fact, operating costs and maintenance increases, so that they will be ready.

In terms of the fast sealift, specifically, it is true that what the Administration has done is, over $200 million worth of that fast sealift money was used as offsets for the military personnel reprogramming, and CHAMPUS reprogramming was accepted by the Congress as such.

We are taking a new approach, the Navy has a task group in place, which is broader than our efforts have been up to now, and they owe a report, I believe, to the Congress, September of this year, on the R&D side of that, and where we ought to go with fast sealift so that we have actually got a planned program into which we can put the kind of money that may be useful and may contribute most.

But the dollars, what you are looking at is maximizing capability against the requirement. I think we would agree on that. That is what we are trying to do. The question that we have is whether or not fast sealift is, in fact, the way to maximize the dollars and gain and maintain the most capability for that.

Senator LOTT. Thank you for your patience, Mr. Chairman. I have just one last comment, and then I will yield my time. We have been talking about this problem in this city for 20 years. How long is it going to take us to get a plan and start to implement it? I still do not think the Administration or the Congress or all of us together know where we are headed with sealift capability, and I hope that we can get a conclusion on that this year and go forward with it.

Senator KENNEDY. Senator Shelby.

Senator SHELBY. Thank you, Mr. Chairman.

Mr. Secretary, since force projection or projected force is based fundamentally on our ability to move our forces either by sea or air, is it not a very dangerous situation to, as we shrink our bases around the world, shrink also our ability to project our forces? Is that not fundamental?

Mr. BERTEAU. There is a fundamental trade off there that we would have to be very careful about withdrawing, as I commented earlier. As we reduce our forward deployed force structure, it does change the equation in terms of what kind of lift capability you need.

Senator SHELBY. Since there are no roads that we know of, other than sea lanes; and up above there is no other way to move our forces, other than sea and air.

Mr. BERTEAU. The only other part of the equation would be whatever we would have prepositioned or available wherever we would deploy.

Senator SHELBY. I want to focus in, and maybe it was done earlier and I was not here earlier, on the research and development cost of the C-17. General Johnson, it seems to me, and also the GAO, that it was rather high considering a lot of this technology was already known. Is 13 percent R&D for something like this C-17 pretty high in the annals?

General JOHNSON. It depends upon what you include in research and development. In this particular program, we included over $800 million worth of tooling, which some would say——

Senator SHELBY. Why do you include the tooling in R&D, rather than the production? Isn't this a basic thing that you do in most weapon systems?

General JOHNSON. It was at the direction of the Congress to do that.

Senator SHELBY. Ordinarily, would you do it if it were not at the direction of Congress?

General **Johnson**. In previous programs, I do not believe that was done. In this program, and perhaps in subsequent ones, it was decided that it is a better way of accounting, to include it in the R&D. But that necessarily inflates the R&D costs when you do that.

Senator **Shelby**. By a great amount?

General **Johnson**. Yes, sir.

Mr. **Berteau**. If I might, Senator Shelby, frequently that question is the subject of negotiations when we negotiate with the contractor, and particularly if we are negotiating with more than one. With respect to the percentage, there are a number of programs where you are really pushing the leading edge of technology beyond where you are, for example, with the C–17, where the R&D costs as a percentage of total R&D and procurement cost is substantially higher than 13 percent.

Senator **Shelby**. But this is on the cutting edge of technology, is it not?

Mr. **Berteau**. For lift capability, yes it is.

Senator **Shelby**. I am not saying the C–17 is. I am saying in the abstract sense, when the R&D costs go up, you are dealing with the cutting edge of technology, whereas here in the C–17, you are not dealing with much cutting edge technology, are you?

Mr. **Berteau**. No. But just off the top of my head, I would have trouble thinking of a major program where the R&D portion was much less than 13 percent. I have a great deal of trouble thinking in my own mind of any that would be substantially lower than that.

Senator **Shelby**. But if the tooling had not been included, it would have been substantially less, would it not General?

General **Johnson**. Yes, sir. If you compare the C–17 to the 747, which was an evolution also, they would be comparable without the tooling, almost exactly the same.

Senator **Shelby**. Did you get into the unit cost earlier, Mr. Chairman? As the Secretary of Defense reduced the number that he wanted to buy of the C–17, what did that do to the unit cost? It almost invariably goes up, and if it did, what percent was the unit cost projected?

Mr. **Berteau**. I talked, I think, in response to Senator McCain's questions there. We are currently discussing that with the contractor and do not have a new cost estimate to put on the table of what that would be. Our estimates are that, in fact, the program will be down something very close to $11 billion to $12 billion below what the $41 billion total program was.

Senator **Shelby**. What is your unit cost projections with the reduction of the number? They go up.

Mr. **Berteau**. I have not pulled the calculator out and done it. Yes, sir. The unit costs do go up. We are still working with the contractor on what that would be. I do not have a final number, but the costs will certainly go up.

Senator **Kennedy**. You have got to have that figure if you are going to take this and talk about a major element in the airlift, and to be able to go to the floor with it. Someone is going to ask what the cost of the unit is, and we are going to have to do a hell of a lot better than saying, well, you are talking to the contractor now.

Mr. BERTEAU. Mr. Chairman, I recognize that. In fact, that is not only for the C–17, but for all six of the aircraft programs that were adjusted in the Secretary's major aircraft review, and I believe he committed to providing the committee with those figures as soon as we have them.

Senator SHELBY. How much money do you think, Mr. Secretary, we will eventually save? I am not speaking in the first year, second year, because of the reduction of the number of units that we would buy here; or will we save very much, if any?

Mr. BERTEAU. In terms of procurement costs, we will save something around $11 billion. My guess is somewhere between $10.5 billion up to about $12 billion.

Senator SHELBY. That is a projected cost at this time, but there is always slippage there, is there not?

Mr. BERTEAU. There is the potential for slippage. We also save in terms of the operational costs, because the C–17 is substantially cheaper to operate than the C–141s.

Senator SHELBY. Well, we were going to get that anyway, because of the numbers.

General Johnson, did you have anything?

General JOHNSON. No, sir.

Senator SHELBY. Mr. Secretary, that is all I have. Thank you.

Senator KENNEDY. We will submit a number of questions, getting the details of some of the things I had hoped to be able to get in earlier, but which I hope you will give us response to. Other members have questions on it, as well. We will submit those. I want to thank you very much.

Our next witnesses are: Ms. Nancy Kingsbury, Director of Air Force Issues, General Accounting Office; and Major General Steve Croker, Director of Strategic, Special Operation Forces, and Airlift Programs, Office of Assistant Secretary for Acquisition. They will testify regarding the status of the C–17 program. We welcome you both back to the committee.

STATEMENT OF NANCY R. KINGSBURY, DIRECTOR, AIR FORCE ISSUES, NATIONAL SECURITY AND INTERNATIONAL AFFAIRS DIVISION

Ms. KINGSBURY. Thank you very much, Mr. Chairman. I am representing GAO and am very glad to be here this morning to participate in this hearing and to share with you GAO's concerns and observations about cost increases and schedule problems, and the risks of concurrency in the C–17 program. I have prepared a somewhat lengthy detailed statement for the record which, with your indulgence, would be submitted for that purpose. I will present a somewhat shorter version in order to get the dialogue going.

Senator KENNEDY. Your full statement will be printed in its entirety.

Ms. KINGSBURY. Thank you very much. In August 1989, we reported that the C–17 program faced significant cost, schedule and performance challenges. On April 26, 1990, as has been referred to here earlier today, the Secretary of Defense proposed to restructure the C-17 program significantly by reducing the program from 210 to 120 production aircraft, reducing the pending fiscal year 1991 budget request from six to two aircraft, and reducing advanced procurement funds from 12 to six aircraft for fiscal year 1992. We have continued to review the program, and our testimony provides current information on the status of that program.

Basically, our view is that even though some progress has been made in developing the C-17 aircraft, the program still faces significant cost and schedule challenges. For example, in the past year, before the Secretary's decision to reduce the number of C-17s, as Senator McCain observed, the cost estimate for the original 210 production aircraft program had increased 11 percent over the previous estimate, from $37.5 billion to $41.8 billion.

Without aggressive Air Force and contractor action, in our view, the new 120 aircraft program could also experience significant cost growth. Also, the C-17's first flight date has slipped from August 1990 to June 1991, and further delays may occur because of continuing difficulties with aircraft assembly and avionics development and testing. In addition, the projected weight of the aircraft could still adversely affect whether contract performance requirements can be met.

On the basis of current scheduled delays and the resulting funding build-up, we believe the Congress should consider further reducing the proposed fiscal year 1991 buy of two C-17 aircraft. A reduction in 1991 could provide an opportunity to further reduce concurrency in the program by having the Air Force limit production commitments until the critical elements of a realistic and achievable flight test program can be completed and any identified problems resolved.

And in that regard, Senator, it was observed earlier, or characterized earlier, that the revised program is less concurrent. I am not sure we share that view. We have not seen all the details yet, but our initial analysis suggests that the number or the proportion of the program that would be sought for approval by the Congress prior to the completion of flight testing is about the same for the reduced program as it was for the earlier program, about 25 percent, but we can get into that later.

DOD, Air Force, and contractor officials have told us that further reduction in the fiscal year 1991 program would not be feasible to manage. Our view is that, given that through 1990 there are 10 production planes in the pipeline, and the first one will not be completed until later this year, our analysis suggests that a further reduction could be used to extend and level out the production program until completion of flight testing, and until resolution of the manufacturing problems that we have talked a little bit about this morning.

We believe that the possible negative effects of reducing production funding in 1991 could be offset by benefits of a less concurrent program. The Air Force is currently developing a new production schedule for the C-17, and now would be a good time to take into consideration the possibility of further reducing concurrency risks.

We believe that further reductions in the 1991 procurement program could be a part of a program to reduce that concurrency, and

I think I will conclude my statement there, Mr. Chairman, and be happy to take any questions after General Croker has finished.

[The prepared statement of Ms. Kingsbury follows:]

Statement of
Nancy R. Kingsbury
Director, Air Force Issues
National Security and International Affairs
Division

Status of the Air Force's C-17 Aircraft Program

Mr. Chairman and Members of the Subcommittee:

I am pleased to be here today to discuss GAO's concerns about cost increases, schedule problems, and the risks of concurrency in the C-17 aircraft program. In August 1989 we reported[1] that the program faced significant cost, schedule, and performance challenges. On April 26, 1990, the Secretary of Defense proposed to restructure the C-17 program significantly, reducing the program from 210 to 120 production aircraft, the pending fiscal year 1991 budget request from 6 to 2 aircraft in fiscal year 1991, and advanced procurement funds from 12 to 6 aircraft in fiscal year 1992. We have continued to review the program, and our testimony provides current information on the status of the program.

RESULTS IN BRIEF

Even though some progress has been made in developing the C-17 aircraft, the program still faces significant cost and schedule challenges. For example, in the past year, before the Secretary's decision to reduce the number of C-17s, the cost estimate for the original 210 production aircraft program had increased 11 percent, from $37.5 billion to $41.8 billion. Also, the C-17's first flight date has slipped from August 1990 to June 1991, and further delays may occur because of continuing difficulties with aircraft assembly and avionics development and testing. In addition, the projected weight of the aircraft could still adversely affect whether the contract performance requirements can be met.

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[1] Military Airlift: C-17 Faces Schedule, Cost, and Performance Challenges (GAO/NSIAD-89-195, Aug. 18, 1989).

On the basis of current schedule delays and the resulting funding buildup, we believe that Congress should consider further reducing the proposed fiscal year 1991 buy of two C-17 aircraft and the advanced procurement funds for 6 aircraft in fiscal year 1992. This could provide an opportunity to further reduce concurrency in the program by having the Air Force limit production commitments until the critical elements of a realistic and achievable flight test program are completed and any identified problems resolved. DOD, Air Force, and contractor officials have told us that any further reduction in the fiscal year 1991 program could cause problems for the subcontractors. It is not our intention to cause difficulties for the subcontractors. However, even with the reduction to two aircraft in fiscal year 1991, there is still a high degree of concurrency risk in the program. Reducing the 1991 buy could reduce the risk of concurrency further.

BACKGROUND

The Air Force and Douglas Aircraft Company (Douglas), McDonnell Douglas Corporation, are developing the C-17 aircraft to modernize and improve the Air Force's intertheater (from one area of operation to another) and intratheater (operations within the same area) airlift capability. The aircraft is expected to improve U.S. capability to rapidly project, reinforce, and sustain combat forces worldwide.

The C-17 will be a four-engine, wide-body aircraft with a three-person crew. It is being designed to airlift substantial payloads over long ranges without refueling. The C-17's projected ability to airlift the full range of military cargo directly into small, austere airfields distinguishes it from the other aircraft in the airlift force, such as the C-5, C-141, and C-130.

The Air Force planned to acquire 211 C-17 aircraft (1 test aircraft and 210 production aircraft) through fiscal year 1999. The program is currently in full-scale development and transitioning to concurrent development and low-rate initial production. The C-17's first flight was planned for June 1991. An Air Force test plan, that combined development, test, and evaluation and initial operational test and evaluation was scheduled to be completed by June 1993. Initial operational capability was also scheduled for June 1993.

On April 26, 1990, the Secretary of Defense testified before the House and Senate Committees on Armed Services on the results of a review of several major aircraft programs, including the C-17. During his testimony, the Secretary recommended that the C-17 program be reduced from 210 production aircraft to 120 production aircraft. The change was based, in part, on the results of the major aircraft review for the C-17. The recommendation is estimated to reduce the President's fiscal year 1991 budget request from about $2.7 billion for 6 aircraft in fiscal year 1991 and advanced procurement funds for 12 aircraft in fiscal year 1992 to about $1.7 billion for 2 aircraft in fiscal year 1991 and advanced procurement funds for 6 aircraft in fiscal year 1992. According to the Secretary, these reductions would allow more time for flight testing before the production rate increases. The cost to buy 120 aircraft was estimated to be about $29.9 billion, or about $11.9 billion less than the current estimate of $41.8 billion to buy 210 aircraft. The Air Force is refining the recommended reduction by calculating specific cost and schedule impacts.

PROGRAM COST

The Secretary's decision to reduce the number of aircraft in the C-17 program will reduce the estimated cost of the program. However, based on a history of significant cost growth in the program to buy 210 aircraft, DOD and the Air Force will have to take actions to ensure that the program to buy 120 aircraft does not also have rapid cost growth.

Total Program Cost Growth

When full-scale development of the C-17 began in 1985, DOD estimated the program acquisition cost would be $34.5 billion in then-year dollars. In 1989 the estimate increased by $3 billion to $37.5 billion. The most recent estimate for the 210 aircraft is $41.8 billion, an increase of $7.3 billion, or 21 percent, since 1985. As reported in DOD's December 31, 1989 Selected Acquisition Report, the latest increase of $4.3 billion was caused by increased projected inflation rates and delays in the program. The recommended reduction to 120 aircraft will reduce total program cost. The Air Force is still working on new estimates of program cost and schedule to reflect the recommended reduction.

Buildup of Funds

Delays in the production of C-17 aircraft have resulted in a buildup of unobligated funds for the program. The Congress appropriated $1.2 billion in fiscal year 1990 for the production of four C-17 aircraft. However, as of April 30, 1990 (the halfway point of this fiscal year), only about $172 million had been obligated. The contract award and release of procurement funds for the fiscal year 1990 buy of four aircraft is not scheduled to occur until after the test aircraft is completed in December 1990. Also, the Air Force does not plan to provide Douglas with the fiscal year

1991 production funds until September 1991, near the end of the fiscal year.

Research and Development Costs

You requested specifically that we review C-17 research and development costs to determine why these costs seemed proportionately high for an aircraft that employs few technologies that have not been used in other Air Force or commercial airplanes. Our review of this issue is ongoing, but we can provide you with a summary of our findings to date.

The Air Force estimate of C-17 research, development, test, and evaluation (RDT&E) costs is about $5.34 billion as of December 1989, or about 13 percent of the total cost for 210 aircraft. About $725 million of this is for initial tooling for the C-17. The October 15, 1986 Conference Report on Making Continuing Appropriations for Fiscal Year 1987 required that C-17 initial tooling be funded with RDT&E funds, rather than with production funds. Normally, RDT&E funds are used for engineering development, construction of the test aircraft, and testing.

Our analysis shows that the most significant contributors to RDT&E costs are related to integrating the component systems and structures into a workable aircraft, testing the component systems and structures to ensure that the aircraft will be able to meet specific performance requirements, and procuring the developmental aircraft's engines and wing. Although the C-17 involves many technologies that have been used in other aircraft, Air Force and Douglas officials consider the C-17 to be a state-of-the-art transportation aircraft, and not significantly complex. However, these officials have emphasized that the design of a new military airframe and the integration of new components, even when the technologies are proven, is a sophisticated and expensive effort.

SCHEDULE

The first flight of the C-17 development aircraft has been delayed from August 1990 to at least June 1991. The delay was caused by continuing difficulties with aircraft assembly and avionics development and testing.

Assembly Delays

Since assembly began in August 1988, Douglas has continually missed major assembly milestones. For example, the milestone of joining the wing to the fuselage was originally scheduled to start in June 1989, but it started in March 1990, a delay of 9 months. Completion of assembly of the first aircraft was originally planned for January 1990, but Douglas currently plans to complete assembly by December 1990, a delay of 11 months. Because of production problems, at the end of 1989 the major milestones for the test aircraft were rescheduled. According to the Program Director, this revised assembly schedule has been met. For example, Douglas started joining the development aircraft's wing and fuselage in March 1990. This met the revised assembly schedule program.

In 1989 we reported that slips in the assembly schedule were caused by late engineering drawings and late delivery of tools and parts. These problems still exist and have caused work that was planned to be completed early in the assembly process to be postponed and done further down the assembly line. Douglas' current plans do not show how the deferred work can be completed in time to support the planned June 1991 first flight date. As a result, we believe it is difficult to predict when the first flight of the C-17 will occur.

Avionics Development and Testing

In 1989 we reported that subcontractors were behind schedule in developing mission computer software and electronic flight control system hardware and software. These delays caused Douglas to change its software development strategy and delivery schedules.

The C-17's mission computer provides the primary electronic communications link for the aircraft's avionics systems, controls the pilot displays, and facilitates other mission-related functions. Mission computer software is critical to completing the integration of the C-17's avionics systems before the first flight test of the development and production aircraft.

The Air Force originally planned to have all of the mission computer's software available for the first flight test of the development aircraft. The software currently available for the first flight test will perform about 40 percent of the required functions and support the first 6 months of flight testing. Current plans call for most of the software to be available before the first production aircraft flight test, currently scheduled for September 1991.

To support avionics integration, mission computer software is being delivered in segments between February and December of this year. Fully qualified flight software is scheduled for delivery in October and fully tested hardware and software in early December. Douglas officials told us that first flight would be jeopardized if the software is late and that, even if deliveries are on time, the integration test schedule is ambitious. According to Douglas officials, recent software deliveries have been on time and the integration test schedule is typical of new development programs.

The electronic flight control system is a key element that must be integrated with the mission computer. The electronic flight control system directs and controls the movement of the aircraft.

Progress has been made with this system since our last report. In 1989 Douglas selected a new subcontractor, centralized flight control system development in a new organization, and added managers and engineers with experience in electronic flight control system development. To date, the subcontractor is ahead of schedule, but completing and qualifying the first version of electronic flight control system software by October 31, 1990, remains a challenge.

Concurrency

In 1989, we expressed concern over the concurrency that was planned in the C-17 program, that is, the extent to which development and production overlapped. We noted that concurrency can be an effective technique to expedite fielding a system. However, it must be well planned and managed or it can cause cost, schedule, and performance problems.

Under the program to buy 210 aircraft, concurrency would have increased. For example, delays in the flight test program had increased the program's concurrency to the point that procurement of 52 aircraft, or about 25 percent of the total production, would have been requested before flight testing would be completed. Even with the Secretary's recommendation to reduce the number of aircraft from 210 to 120 and the fiscal year 1991 buy from 6 to 2 aircraft, concurrency still exists.

If flight testing is completed as scheduled in June 1993 and the 1991 buy is carried out as proposed by the Secretary, funds for 30 C-17 aircraft, which is still 25 percent of the revised buy of 120 aircraft, could be authorized before flight testing is completed.

However, if no aircraft are authorized in fiscal year 1991, 2 aircraft are authorized in fiscal year 1992, and 4 in fiscal year 1993, funds for only 16 aircraft would be authorized for production before flight testing is scheduled to be completed in fiscal year 1993. This would result in significantly less concurrency. The Air Force is still working on a new production schedule.

CONTRACTOR PERFORMANCE

The Air Force Plant Representative Office (AFPRO) assigned to Douglas is responsible for determining whether Douglas' performance in areas such as engineering and design management, manufacturing operations, quality assurance, and subcontractor management is effective. Over the last 2 years, the AFPRO has identified problems with manufacturing, software development, quality assurance, scheduling, cost estimating, and subcontractor management. The AFPRO believes Douglas does not have the systems in place to effectively manage these areas. As a result, the AFPRO believes that Douglas cannot produce the C-17 to either budgeted cost or planned schedule. GAO's observations on the C-17 program support the AFPRO's assessment.

According to the AFPRO, Douglas' lack of cohesive and organized systems resulted in late drawings, parts shortages, late supplier deliveries, and unreliable quality. The AFPRO believes these are the reasons that the C-17 is behind schedule and over budgeted cost. The AFPRO advised Douglas that upper-level management oversight, planning, and integration are needed. Douglas is developing plans to address these issues. The AFPRO believes that Douglas cannot produce the C-17 cost-effectively, with acceptable quality, and on a predictable schedule until these areas of deficiency are corrected.

Recently, the Assistant Secretary of the Air Force for Acquisition directed a review of contractor problems identified by the AFPRO. As a result of the review, Douglas and Air Force officials have established an executive level Quality Council to resolve these system problems. In addition, the Deputy President for Douglas told us McDonnell Douglas Corporation is committed to correcting the problems in the program, as shown by the numerous senior managers and engineers the corporation has transferred to Douglas. As we continue assessing the C-17, we will evaluate the impact of these changes.

PROJECTED AIRCRAFT WEIGHT

Aircraft weight is a principal factor that determines whether an aircraft can meet payload, range, and takeoff and landing performance requirements. The program office believes that the current estimated weight of the C-17 will cause it to fall short of contract requirements. The program office does not intend to reduce this contract requirement and is working with Douglas to improve aircraft performance and revitalize Douglas' weight savings program. According to the Commander-in-Chief, Military Airlift Command, the C-17's performance will be improved by changing the jet fuel the aircraft would use.

REDUCTION IN REQUIREMENTS

When the Secretary of Defense recommended a reduction in the program buy from 210 to 120 aircraft, he acknowledged that airlift requirements had been reduced. He noted that, until recently, the possibility of a major conflict in Europe coupled with simultaneous action in another region had driven the demand for military air transport capacity. He added that although changes in Europe have reduced these requirements, the most effective means to deter crises in other regions is to be able to react with a rapid buildup of combat power. According to the Secretary, the

C-17 remains the most effective transport aircraft for meeting airlift goals because of its ability to utilize the shorter runways typical of third world countries and deliver outsized cargo.

In December 1989, the Secretary of Defense directed a review of four aircraft programs including the C-17. The House Committee on Armed Services has requested that we evaluate the Secretary's review of the C-17. We have just begun our work, but we can provide you with some initial information. A DOD steering group and four working groups were established to review the four aircraft programs, including one for the C-17. The groups were to examine (1) the capabilities needed that are not provided on current aircraft, (2) the extent to which the aircraft under review would provide the needed capabilities, and (3) the fiscal and acquisition strategy considerations, including cost, schedule, and performance. The group reviewing the C-17 developed and analyzed seven alternatives involving mixtures of different airlift aircraft. Resulting airlift capacity and total acquisition cost were calculated for each alternative. According to DOD officials, the Secretary considered this analysis and other information when making his recommendation to reduce the number of aircraft in the C-17 program.

IMPACT OF REDUCING FISCAL YEAR 1991 PROGRAM FURTHER

The President's fiscal year 1990 budget requested 10 C-17 aircraft in fiscal year 1991, but the fiscal year 1991 budget submission reduced the fiscal year 1991 request from 10 to 6 aircraft. The Secretary of Defense has proposed a further reduction to two aircraft in fiscal year 1991 and advanced procurement funds for only six aircraft. Preliminary DOD estimates show that these reductions in aircraft would reduce funding requirements in fiscal year 1991 from $2.7 billion to $1.7 billion. According to the

Secretary of Defense, this reduction should also allow more time for flight testing before production is increased.

As discussed above, the program is experiencing schedule delays--completion of assembly of the first aircraft has slipped 11 months. Also, funding for the program is building up--over 85 percent of the fiscal year 1990 funds had not been obligated halfway through the fiscal year. Contributing to the funds buildup problem is the fact that contract award and release of funds for the fiscal year 1990 program will not occur until after December 1990 which is in fiscal year 1991. Even with the Secretary's proposed reduction, concurrency would still be a problem. Given these circumstances, we believe that Congress should consider reducing the fiscal year 1991 C-17 program further. This would provide an opportunity to revise the production schedule, reduce the amount of program funds that are unobligated, and reduce concurrency in the program further by allowing additional time to perform flight tests before production is increased.

On the other hand, delaying the procurement of the C-17 could increase total acquisition costs because of inflation, unless significant production efficiencies are achieved. Air Force and Douglas officials have told us that eliminating one year's production, while continuing research and development and advanced parts procurement, could send the wrong signal to subcontractors. They said that the subcontractors may then decide to delay purchasing or not to invest in equipment they would need to increase C-17 production. They also told us that a delay could result in the cancellation of some subcontracts. It is not our intention to cause problems for the subcontractors. However, even with the fiscal year 1991 reduction there is still a great deal of concurrency risk in the program. Additional reductions in funding for the fiscal year 1991 program could reduce concurrency risk further. Therefore, we believe that the possible negative effects of reduced production funding in 1991 would be offset by benefits from a less concurrent program.

The Air Force is currently developing a new production schedule for the C-17. Now would be a good time for the Air Force to develop a program plan that reduces concurrency risk as much as possible. Further reductions in the fiscal year 1991 program could be a part of a new program that reduces concurrency.

This concludes my prepared statement, Mr. Chairman. I will be happy to answer any questions you may have.

Senator KENNEDY. General Croker.

STATEMENT OF GENERAL STEVE CROKER, USAF, DIRECTOR OF STRATEGIC SPECIAL OPERATION FORCES AND AIRLIFT, OFFICE OF ASSISTANT SECRETARY OF ACQUISITION

General CROKER. Senator Kennedy, I was not provided the opportunity to submit a written statement, but I very much appreciate the thoughtfulness of the Committee in permitting me to testify with the GAO this morning. I did have an opportunity to look at their opening statement this morning, and I would like to make a few brief comments.

I am reminded, first of all, of the comment that General Jack Vessey, the former Chairman of the JCS made to me. He said that there is not any problem so complex that you cannot find a solution that is clear and understandable and simple and wrong.

Senator KENNEDY. He is quoting H.L. Mencken. [Laughter.]

General CROKER. Yes, sir. What I would like to say about the comments from the GAO is, in part, we agree with them. However, I have significant reservations about the suggestions which imply that last year's cost growth might continue in the future, without explaining in more detail the causes of last year's cost growth. They imply that because the first test article is going to be 10 months late, that subsequent aircraft will be as late or later, and that is not true.

They ignore the fact that the long lead contract, itself, as opposed to the aircraft, is on schedule, and that 65 percent of that work is outside of Douglas. They ignore the impact on the employee learning curve. If we zero out the production in 1991 and have to start over basically with a T-1 article all over, it is going to take some 2 to 3 years to achieve the level of efficiency that we will have achieved by the time they terminate production; and they ignore the risk of losing the work force; we already estimated some 40 to 50 percent of the trained work force will be lost in the drop from four to two aircraft in 1991.

They ignore the fact that the contract is event-based and going to Senator McCain's question earlier, I think it is very significant, this is the first major contract innovation where you have an event-based contract, and the reason that there is money withheld in 1990, a significant amount is, because the contractor has not achieved his delivery schedule with the first test article, and when he does that, some $800 million will be given to him and the next contract will be awarded.

The next major event is the flight of T-1, and again, there will be money withheld until that performance is met. So, the interests of the Congress are being addressed in that fashion.

The report ignores the bathtub on manpower. The contractor is going to have to level that out, so, in fact, if we zero production in 1991, we may increase further delays and work against their interest in reducing concurrency.

It ignores the fact that the long lead items in 1991 are already on contract and some of the fabrication is already being done, and if we terminate the production in 1991, we are going to have to store a number of those parts, some of which are subject to deterioration, for example, titanium.

The report ignores the effect that the indirect and fixed direct labor costs contribute to overhead, and if we zero out the 1991 production, we are going to have to distribute those costs against fewer aircraft, the aircraft we have already contracted for, and we will incur a liability, and that will increase the cost.

They ignore the significant Douglas debt to facilitate the production with the anticipation of their return on investment, and I think it is going to drive Douglas to try and make those same dollars on fewer aircraft to repay their loans, perhaps increasing the aircraft cost.

They have ignored the impact on the aging C-141 fleet, which is already suffering the impact of extended utilization, and operationally, they ignore the fact that the longest leg, the most challenging non-refueled leg is Dover to Lajes, which is some 150 miles shorter than the capability demonstrated by the aircraft, or estimated for the aircraft today. So, it can meet the mission requirements.

In sum, the GAO report makes many accurate observations about the lack of Douglas management in the past, but it understates the significant Douglas improvements since the November rebaselining. They do not provide you a dollar impact to the U.S. Government if their proposal to zero the production in 1991 is carried out. Their proposal does not save dollars. It does not improve employee learning. It does not decrease concurrency. It does not add program stability, and it does not capitalize on the significant McDonnell-Douglas management investment and resources in people since November. It does save dollars in fiscal year 1991, but those costs will be greater in 1992 when the Gramm-Rudman targets are even more severe.

My own personal impression is that Douglas can build aircraft. They are now building a quality aircraft in the first C-17, T-1, and they have made visible improvements in the first production aircraft.

Thank you very much, Senator, for the opportunity to make those remarks.

Senator **Kennedy**. Thank you. General Croker, the Congress has been waiting for the revised schedule for the C–17, which reflects decisions made by Secretary Cheney as part of the major aircraft review. When will we get the revised program and budget schedules?

General **Croker**. Sir, I will give you the information I have today. The total program cost, the acquisition unit cost for the 210 aircraft profile is about $199 million. In our estimate, based on the Secretary's profiles, it will now be $249 million. The fly away unit cost was to be $144.2 million. It is my estimate that it will be approximately $173 million. We have a sunk cost of about $5.1 billion, and the cost to go in the old program was $34.2 and it will be about $22.9.

I think we can capture the savings that the Secretary advertised in 1991. We can capture the savings that the Secretary advertised for 1990 to 1994, and we can capture the savings that the Secretary advertised over the POM, 1992 to 1997. There are still some questions about the actual buy profile itself, in the number of aircraft that will be required to be built in the year past the POM, and that will affect the total program savings that the Secretary has talked about.

The previous witness mentioned a range somewhere between $10.5 billion and $12 billion. My own personal assessment is the total savings will be closer to $10.5 billion than the $12 billion mentioned in the Secretary's testimony.

Senator **Kennedy**. I think he gave that range as $10.5 to $12 billion.

General **Croker**. Yes, sir. And what I am saying is, that it is more likely to be $10.5 than $12, if we are to deliver all the savings the Secretary advertised during the POM years.

Senator **Kennedy**. Now, is this your estimate or is this being agreed now by the——

General **Croker**. Sir, this is my estimate. This is the Air Force estimate. We are reconciling this difference, the price differences, first with OSD and then we will go to the company itself, but those are the program manager's best estimate on the information we have to date.

Senator **Kennedy**. But we have not, from the company itself, received a certified figure of what it is going to cost?

General **Croker**. No, sir. What we will have to do, first of all, is get the Secretary's decision on precisely the profile that he wants to get to in the savings, and then we will have to issue direction to the program manager, and he will go to the company with a formal proposal, but he is using the best cost information that he has now to attempt to price the Secretary's decision, and that is what I am offering you today to aid in your decision-making.

Senator **Kennedy**. Do you have the schedule? Do you have the program schedule?

General **Croker**. Yes, sir.

Senator **Kennedy**. Could you submit it?

General **Croker**. Sir, the Secretary's program schedule is to buy two aircraft in 1991, down from 10 originally, and 6 in the President's budget. Six in 1992, 12 in 1993, 18 in 1994, 24 in 1995 and 24 to peak thereafter, for a total cost of $29.9 billion. And, as I have said to you, the difference between that and the original program is subject to some reconciliation between the Air Force and controller's office in OSD.

Senator KENNEDY. The Air Force Plant Representative Office, AFPRO, has been quoted in several places as having major problems with the implementation of total quality management, asserting that schedule is driving the contractor at the expense of quality.

Ms. Kingsbury, you have full-time representatives at the contractor's plant. Do they share this view?

Ms. KINGSBURY. Yes, sir. I think certainly based on the history of performance, they do, and we have talked to the AFPRO as recently as 2 weeks ago. There clearly have been some management changes at Douglas. There clearly is a different type of dialogue going on between Douglas and the AFPRO, and there has been some progress made in the last five months. But this is a major program; these are major problems that are talked about. There is a plan to resolve the contractor deficiencies by the end of the year. We will be watching to see what kind of progress is, in fact, being made, but we consider it a positive development that now a plan is in place. There are still a lot of challenges ahead, in our view.

Senator KENNEDY. General Croker, does the AFPRO's view reflect that of the Air Force?

General CROKER. Yes, sir, and I think it is important to note that the AFPRO's comments were published in the Douglas company paper at the request of Mr. Hood, the president of Douglas, specifically because he was concerned about the lack of management attention, the problems that Ms. Kingsbury already talked about, and he specifically, with malice aforethought, asked Colonel Tollefson that those comments be published so that the company would know the users' concerns. He has made a video tape reflecting those concerns and some of the Army's concerns as well, and so I think it is a very accurate assessment of the problems that Douglas had in two key areas—first of all, the overall integrated schedule and, second, management discipline. And as Nancy has mentioned, there have been significant changes, both in the leadership on the C-17 line, and at Douglas itself. We have seen an influx of about 100 software engineers, in addition to a change of about 30 of the top leaders. And, since November, the commitment Mr. Hood made, they have met every major milestone on the road to T-1 assembly, and in fact, the P-1, the first production aircraft is also on schedule. So, we are very encouraged with the flight control computer, and the mission computer progress.

In the one case, the first case, they are 2 weeks ahead of schedule. In the second case, they are on schedule.

Senator KENNEDY. This is the revised schedule.

General CROKER. Yes, sir. In November, Mr. Hood gave General Butchko a pledge, told him when he would deliver the T-1 aircraft, when it would fly, when they would complete the major joins, and when they would start P-1, when they would fix the computers; and Mr. Hood has met every one of those dates. And in the case of the flight control computer, they are actually 2 weeks ahead, because GE has been incentivized and has done a very good job on that contract.

Senator KENNEDY. Which of the major milestone production dates are they meeting at the present time?

General CROKER. Well, sir, they have met the T-1 fuselage, wing, tail join. It is rolling out on its own landing gear soon. They have met the major milestone that puts the various parts of the first production aircraft P-1 in the fuselage. The forward fuselage and the center fuselage went in last week; the aft fuselage will go in this week, and the wing will go in by the 30th of June.

They have met the major milestone on the flight mission control computer. And the—excuse me, the flight control computer and the mission computer. So I think they are, you know, since they have rebaselined the program and made this commitment in November, they have met each of the milestones they have said they would meet.

Senator KENNEDY. Ms. Kingsbury?

Ms. KINGSBURY. We do not—I do not currently have with me the specific milestones. I believe once the revised schedule was put in place, the milestones have, in fact, been met. I would have to agree with that.

I personally have a little bit of concern that we will—the revisions have taken into account that certain things cannot be achieved by, say, the first flight deadline. And so what we—while the milestones will be met, I think, we need to do a little bit of analysis of what we are getting when those milestones are met.

For example, we are recently informed that, while the flight control system will be up and running in time for the first flight, or that is the schedule, it will not be quite the whole system that the original schedule proposed. I think we have to look behind the milestones a little bit to make a further assessment of how well they are actually meeting the schedules. But, clearly, there is some improvement in this short period, since the management changes. And we will look with considerable interest about whether these kinds of changes can continue.

However, Douglas does have systemic problems in their management systems that have not been addressed. As recently as a couple of weeks ago, the Air Force disqualified their purchasing system and now has to approve all their contracting actions over a certain amount of money.

I think until some of these underlying systemic things are corrected, there is still quite a bit that needs to be examined and worked on.

General CROKER. I think, if I can just follow up on that, Senator, I would agree with what Nancy said. The company made a significant commitment in February 1989, to totally reorganize their top management and institute this total quality management.

It has been top-down driven rather than from the bottom up, I think, because of the concern that the chairman of McDonnell-Douglas had. And there are significant inefficiencies. But the point is that the company has been very candid about its errors. They have taken and developed action plans for each of those errors that have been approved by the AFPRO. We are monitoring those. And we see a very, very strong commitment on the part of the company to turn it around and the people in place to make it happen.

Senator KENNEDY. Well, the only point is, why not let the testing, then, catch up with the production?

General CROKER. But let me talk about that for a minute, because Senator McCain made an important point in the last group that was not answered.

In the original program by fiscal year 1991 we would have had 22 aircraft on contract. By 1993, when the testing program is done, we will have asked you for approval for 30 aircraft, but only 18 of those aircraft will actually be on contract, because it is an event-based contract and the contract is not awarded until they perform.

Furthermore, 4 of those 18 aircraft are due to be retrofitted anyway because they are the test aircraft. So, we will only have 11.5 percent of the aircraft actually in work. We will have, in other words, 11.5 percent of the aircraft at risk that we have asked you for money for and put on contract based on Douglas' performance.

The proposal that the GAO has to terminate or further reduce below two in 1991, this current program, will have no practical impact because those airplanes would be delivered about the time the test program is completed anyway. As I have said to you, my fear is that it may actually drive concurrency in the wrong direction, because if Douglas does not want to lose their entire work force, they are going to have to minimize the bathtub in the work force as best they can. And, in fact, it may stretch out the aircraft that they have in production, and it will surely drive up the cost.

Senator KENNEDY. Senator Lott.

Senator LOTT. Thank you, Mr. Chairman.

I would like to ask a series of questions. I will try to make the questions short, and I hope the answers will be as short as possible, too.

First, General, trying to further what I think you have been trying to say, how unusual is it in any new aircraft procurement to experience delays in construction? I mean, it is not excusable, but it is commonplace; is it not?

General CROKER. I would have to say that Douglas has taken the meaning of commonplace to new heights. [Laughter.]

Senator LOTT. You did not help your cause with that answer. But let me——

Senator KENNEDY. Do you have another question like that one? [Laughter.]

Senator LOTT. Let me see if I can shift the blame a little bit or share the blame. I am more familiar with ship building than I am with aircraft procurement. But I do know that in many instances the Government is responsible for or causes the delays due to engineering changes and other change orders, and then quite often it gets to be a real argument about whose fault it is? Well, if the Government causes it, it is their fault.

General CROKER. Yes, sir.

Senator LOTT. Is that applicable here?

General CROKER. I would say that about half of the slip in the total program to date is due to the reorganization and the turmoil that that has caused, in other words, their inability to successfully implement TQM quickly.

I would say about a quarter of the slip is due to the computer delays and the fabrication problems that they have had. And I would say about a quarter of the slip is due to cuts in procurement in previous years. So, if you had to—my personal assessment is, we share about a quarter of the blame, we being the Air Force and the Congress. And about three-quarters of it is due to the company itself.

Senator LOTT. How many quality deficiency reports have been issued to McDonnell-Douglas, and have they all been corrected?

General CROKER. Sir, there have been five alone on what Nancy mentioned previously on the purchasing system. And they have not been corrected yet, and that is why we suspended their approval.

Senator LOTT. None of them have been corrected?

General CROKER. Not yet, sir, and that is why we have suspended their approval to award contracts to the subs over $100,000. They have now developed the plan, we have not yet approved that. There have been numerous, some perhaps 34 other deficiencies at various times that they have either corrected or are in the process of correcting. But I would again say what Ms. Kingsbury said earlier, that in terms of management attention and an integrated schedule down to the third and fourth tier, Douglas still has some work to go.

So, I would not like to leave you with the impression that they have totally corrected their problems.

Senator LOTT. Shifting now to funding, Ms. Kingsbury, you have told us that the C-17 program involves concurrency. Are you recommending that the committee not fund the two aircraft in the fiscal year 1991 budget recommended by the major aircraft review? Or what specific action are you recommending?

Ms. KINGSBURY. It is our view that, given the delays in the production schedule, given the delays in the commitments of funds—and I would like to say at this point that the General has stated that we have not considered and certain impacts will follow from these things; I am not sure we would share his view about what those impacts would be. But in this particular case, given the pipeline and the way it is developing and the likely delays which accrue, partly from the company, partly from having an overambitious schedule in the first place, and partly from other things, such as funding delays and so forth, I suppose, I think we see no evidence yet, and we keep asking the questions, that the kinds of impacts from not funding production in 1991 that the General describes this morning would, in fact, accrue. Therefore, we believe that one of the benefits from slowing the program somewhat, would be to permit the flight test schedule to be completed. The current flight test schedule, by the way, of June 1993, assumes they do not find any problems and major obstacles which most other major weapon systems have found in those phases.

We just think there is some room there to make a short-term savings. It is possible that there would be a little bit of cost implication down the pike. I do not think that is necessarily certain. It is possible with a slower production schedule that efficiencies could be built in, the manufacturing problems could be taken care of, they could ramp up to a faster production increase down the pike and, in fact, regain those costs.

You know, we offer up these alternatives. We do not know the perfect answer at this stage. We do not have enough information, we do not even have the information on the new schedule that the General presented this morning. But we believe that there is room for reducing production funding in fiscal year 1991 to permit a little bit better planning and to permit some of these things that have been major problems, significant problems in the past to be corrected and to gain some confidence that Douglas can, in fact, produce this plane efficiently and on schedule.

Senator LOTT. General, why did the major aircraft review recommend funding two C-17s in fiscal year 1991? What would be the impact if they are not funded?

General CROKER. First of all the impact of going from 10 to six and then six to two was a unit cost increase in 1991 alone of about 23 percent. And when you look at the 1990-1991 slowdown, the unit cost impact per aircraft is about 35 percent. So, clearly, the Secretary did not make his decisions based on an acquisition motivation. You could buy two aircraft in 1991 for $1 billion, four for $1.5 billion and six for $1.8 billion.

So, efficiency-wise and logic-wise, if you were looking with tunnel vision purely as an acquisition person, you would not recommend two. I think the Secretary went to two, because he knew it was the minimum number you could have and still sustain the work force, not risk the loss of that, not impact the subs adversely, maintain the event base contract with the very good warranties that we have right now, and not have to worry about the loss of tooling and storage fees and any breaks in the contract.

My own view is that you cannot go to zero in 1991, the Secretary felt that two was as low as you could go and address the concerns that the GAO and Mrs. Kingsbury have already addressed.

Senator LOTT. I have one last question. With regard to the two C-17s in fiscal year 1991, would you release these funds prior to the first flight of the second aircraft?

General CROKER. Sir—I want to make sure I understand your question precisely—but each major contract release and each major funds release is event based. In other words, we are not going to release any money until the company does exactly what it is supposed to do.

And, for example, the airplanes will be released for, I think, Lot 4 is coming up next which is dependent on T-1 assembly. Lot 5 is based on the first flight, T-1 and P-1's first flight. So, we will not release any of these monies or award the contract until the company has demonstrated that they can actually perform.

Senator LOTT. When do you expect that to be? I mean, you just do not know, right?

General CROKER. Oh, no, sir, that is not true. I have a schedule right here.

I expect the T-1 assembly to be done in December 1990 as opposed to January 1990, and Nancy has already mentioned that. I expect the first flight for T-1 to be in June of 1991. The Lot 3, I have already mentioned.

Senator LOTT. Mrs. Kingsbury, do you all basically agree with these times?

Ms. KINGSBURY. Yes, I think, you know, that is the current schedule, to the extent we know it. And it is also true that with event-based contracting, which we, by the way, think is a very positive aspect of this program, these funds would not be released until the events that the General referred to would take place.

I think it is important to recognize, however, for example, that the fiscal year 1990 funding, which has been made for four aircraft, is not scheduled to be released until well into fiscal year 1991. There just seems to be enough of this program moving out into these years that we do not see the sense of building up funds which effectively are going to sit around unused and make a commitment to the program prior to—at that level—prior to finding out whether or not this aircraft will fly, which it probably will, and will do what it is intended to do, which maybe it will, but that remains to be seen.

General **Croker**. But Senator Lott, the point is that the contract is event based. And we are not going to award the 1990 contract until T-1 is assembled. And it was originally going to be in January 1990, so those monies that Nancy just mentioned would have been released. But now it is going to be December 1990, in other words it will be into the second quarter, end of the first quarter of fiscal year 1991.

But that is how an event-based contract works. You withhold those funds on the contract award until the contractor performs. At the same time, he has an award fee, he is incentivized to try and resume and make up the schedule. And he has demonstrated that he has a commitment, with the overtime he has already put on, to try and restore the schedule and make the plan that he has right now. And he has demonstrated that he can do that.

Senator **Lott**. Thank you, Mr. Chairman.

Ms. **Kingsbury**. If I could add one more thing to that, Senator. First of all, we would just call to your attention that the plane that we are talking about being completed by the end of December 1990 was funded before 1988. I mean, we are talking about a very long time that this sort of thing develops here.

The other thing that I think we need to point out is that, while these events are clearly laid out in plans, some of the details have not fully been worked out. It is my understanding, for example, that what assembly complete really means has not entirely been defined. And I think that there is a little bit of room for maneuvering in those regards too, even within the context of what is otherwise a very positive approach to procuring an aircraft.

General **Croker**. We do have an assembly complete definition that the Air Force and the contractor have signed up to.

Ms. **Kingsbury**. You do?

General **Croker**. Yes.

Senator **Kennedy**. Well, it seems a lot of things are coming on board today. [Laughter.]

General **Croker**. Yes, sir, we are trying hard, Senator. June 12, sir.

Ms. **Kingsbury**. Very good. I admit to being slightly dated on that one.

Senator **Kennedy**. Well, as I understand it, it clarifies it in my own mind and it relates to the questions of Senator Lott. Your testimony is that fiscal 1990 production funds will not be awarded until 3 months into fiscal year 1991, essentially resulting in the fiscal year 1990 production funds covering the 1991 production period and further delaying 1991 production funds until 1992. This would result in, at most, a 1-month slip in the program, presuming that the fabrication of the first two aircraft does not slip any further on its own accord.

Ms. KINGSBURY. That is generally the analysis that leads us to the conclusion that some further reduction in 1991 production funding could usefully be approached. I think it may be important to look in detail at the details of what the specific funds can, in fact, be applied to. And there may be some need to build some flexibility for the Air Force to cross these fiscal year barriers with one fiscal year's funds into the next in order to achieve the kind of thing we are talking about. But at this point, we simply do not see the evidence that would suggest it could not be managed, and we see some evidence that it would have some benefits.

General CROKER. Sir, the problem is that the C-17, basically, the money is used in three parts. First of all, you buy the raw materials. And then, second, you fabricate in lots, various of the items that third, will be assembled. And, like I said, we already have the 1991 long-lead contract, you know, on contract to build the long-lead item.

So, it is not simply a matter of trying to tread air or stop the world. You have in train a process that involves the purchase of materials, fabrication and assembly. And you have overhead costs, fixed costs that are distributed across a certain number of aircraft. And if you truncate the buy, you eliminate the work force, put at risk the subcontractors, and you have to redistribute those overhead costs, the liabilities that you have against fewer aircraft, and you drive up the unit cost.

But the C-17 program is designed so that by the event-based contract, we do not award it until they actually perform. And, furthermore, we have incentivized the manufacturer to catch up.

Senator KENNEDY. The difficulty I am finding is that I am hearing some of these answers again and again and again, and I appreciate your emphasis. But it is difficult for me to understand why, in terms of the resource flow and given the endemic problems with a company, and also given the financial analysis of meeting that events-based contract, the most that that would result in is a one-month slip in the program, given the other kinds of uncertainties. I just have difficulty in following why that type of action would be undermining the program.

General CROKER. Let me try and explain for just a minute. You build two—first of all, you build the test article. Then you build two aircraft, then you build four aircraft for each of two years, so you have gradually ramped up your work force. You have a trained skilled work force in being.

Now, under the GAO proposal, you would reduce that buy to zero. You cannot just instantaneously go from four aircraft to zero.

Senator KENNEDY. Given the past sliding of the program, you are finding out that there is a different flowline. I mean, the only thing that appears to be driving this is the fiscal year.

General CROKER. No, sir.

Senator KENNEDY. Because the payments are going out over this period of time.

General **Croker**. Sir, the flawed assumption is that because the first aircraft is 10 months late, subsequent aircraft will be as late or later. And that is not true. We estimate that by the ninth aircraft, we will be as little as two months late and by the 12th aircraft, they will be back on schedule.

Senator **Kennedy**. We have had estimates all the way through this program, and you are saying now that with the changes in the last five months, everything is going to be hunky-dory. But you know, what if you went ahead on that and then someone comes in a year from now and says, why in the devil did you do that, given the track record on it?

Then we'd say, well, because General Croker came up here and testified that they revised the management and how they were going on a good flowline in terms of meeting these results. I do not know how many times we ought to get burned.

General **Croker**. Let me put it another way, Senator.

By 1993, when we finish the test program, we will have asked you for money for 30 aircraft. We will only have 18 on contract with fewer than 14 delivered and four more to be retrofitted. So, only about 11 percent of the program will be at risk. You have 3 years to decide and the Air Force has three years to decide if that was a mistake. But if you zero out the funds now, you will have done irretrievable damage to the C-17 program. That is our assessment.

Ms. **Kingsbury**. Mr. Chairman, we would like to see more evidence going to the issue of what the actual impact would be. We have been trying to get that kind of evidence for some time, on this and other programs, I might add. And we continue to struggle with it. And in the face of that, we are not going to, I think, disagree.

While there may be only 18 aircraft on contract at $250 million apiece, that is a very big bill, if we discover in June of 1993 that this thing will not do what it is set out to do. We think a little bit more prudent approach is something that the Congress ought to be considering, and I guess that is where we come out as a bottom line.

Senator **Kennedy**. Senator Lott.

Senator **Lott**. No further questions, Mr. Chairman.

Senator **Kennedy**. Okay. Thank you very much. You were very helpful, both of you, and very responsive to the questions. I think we will leave this for other questions.

General **Croker**. Thank you again for the opportunity.

Senator **Kennedy**. Thank you very, very much.

Ms. **Kingsbury**. Thank you, sir.

Senator **Kennedy**. Our final witness will be Mr. John Stocker, president of the Shipbuilders Council of America. We welcome you, Mr. Stocker. We have looked forward to your appearance.

We wanted to mention that Senator Cohen had been called to the White House. We hope he will share with Senator Lott and myself what was going on down there. [Laughter.]

We are sure it was a matter of importance. We very much appreciate your presence here. I necessarily have to leave. Senator Lott is going to be chairing, and we are very fortunate because of his longstanding interest in shipbuilding and knowledge about this. We are interested in hearing your testimony.

Senator LOTT [presiding]. You may proceed Mr. Stocker.

STATEMENT OF JOHN J. STOCKER, PRESIDENT, SHIPBUILDERS COUNCIL OF AMERICA

Mr. STOCKER. Mr. Chairman, we appreciate the opportunity to appear here this morning to talk a little bit about the sealift program and its impact on the shipbuilding industry. We want to thank you and the members of the subcommittee in extending the invitation to us.

Let me introduce myself. I am John J. Stocker, president of the Shipbuilders Council of America, which is the national trade association that represents the shipbuilding and ship repair industry in the United States. Our membership currently represents approximately 95 percent of the total workforce in the United States.

I would ask, Senator Lott, that our written statement be inserted into the record. I will make a few brief oral comments, particularly in light of the testimony I heard earlier this morning from General Johnson and Mr. Berteau.

Let me begin by quoting General Johnson's statement that the sealift policy of the United States is to depend on a robust commercial industry. As you correctly pointed out, Senator, the commercial industry, whether we are looking at the shipping side or the shipbuilding side, is hardly robust. There are a number of reasons for that.

I would like to spend a few minutes reviewing that with you, because I think what we are proposing today is really the development of a very unique national defense program that can address in large part the concern that has been discussed in the media, in a widespread way, and that is, what happens to the defense industrial base as we continue to reduce our defense spending into the future in light of the changed conditions, particularly in Europe.

Let me begin by addressing the history over the last 10 years of shipbuilding in the U.S., very briefly. As you know, Senator Lott, the industry in the United States has witnessed a decline in the number of production employees working for it of about 30 percent from a total of 112,000 down to 72,000 today. And we are anticipating further declines in 1991.

This decline is directly attributable to the collapse of commercial shipbuilding in the U.S., which was really triggered by a decision that was made 10 years ago in the Office of Management and Budget to terminate construction subsidies for commercial ships in the United States. The timing could not have been worse, because at the time that the United States made a decision to terminate subsidies to its industry, other countries began ramping up their subsidy efforts as a way of trying to sustain their industries through a very severe shipbuilding recession that occurred in the early 1980s and lasted until the last couple of years.

Only three countries made a decision to terminate subsidies to their industry. Those three, including the United States, were also Sweden and Canada. None of those three countries have any active commercial shipbuilding going on at all, with the exception of one commercial ship that is currently under construction in a U.S. yard.

So, as a result, this industry became very dependent on a single customer. And as I know you are a student of economic theory, Senator, you know that dependence on a single customer is terribly destabilizing. As a result, the industry has gone through a very difficult period of time, both from the competitive aspects as well as the impact on total employment.

Looking at this situation over the past couple of years and recognizing that we really have a very unique opportunity in shipbuilding, that is perhaps not represented in very many other defense industrial sectors, and that is that we are looking at the potential of a real boom in commercial shipbuilding coming in the 1990s. Forecasts that we have been able to discuss with our counterparts around the world have indicated that the boom will climb from now until perhaps the year 1997. It will tail off at that point.

The real question is whether or not the United States will be participating in that boom. It seems to me—as we look at the decline in defense spending, that the thing to do is to figure out ways where we can get a double bang for a buck, where we can develop a response to the sealift shortfalls that were discussed here earlier this morning, and at the same time position our economic policy in such a way that we encourage an industry to develop an export potential, which this industry has not had since the late 1950s.

To this end, we undertook an action last summer which I know, Senator, you are well aware of, when we filed a section 301 trade complaint with the Office of the U.S. Trade Representative, alleging that part of our problem in trying to enter the international market was the extent of subsidy practices of foreign governments.

That petition was withdrawn at the request of Ambassador Carla Hills, so that the United States government could mount a multilateral effort to try to resolve the issue of subsidy practices.

Senator Lott, I am disappointed to say to you this morning that those negotiations appear to have bogged down. While the negotiating team is in Paris, as we speak, our information is that our trading partners—in this case, the Europeans—are finding it very difficult to come to grips with this particular issue. And if we continue along the path of negotiation, which we support, we are looking at, I think, a very long-term effort to try to resolve this issue. Because as I said earlier, the Europeans are having considerable difficulties in straightening out their own internal problems, and that will take some time.

Unfortunately, Senator, we do not have a whole lot of time. And we thought the Congress recognized this last year when they authorized and appropriated the funding that you mentioned this morning for the sealift program.

Now, the sealift program, contrary to some of the remarks that were made by our friends from the Defense Department, does respond to a requirement. Obviously, the sealift shortfall is something that they have to judge. We are not in the requirements business, and they are.

But we have, in fact, discussed with a number of parties, both within the Navy Department and the Maritime Administration how such a program might be approached. And, essentially, there is a broad-based agreement between the two organizations, commercial ship operators and the shipbuilding industry to build a commercially viable ship that will serve as a national defense asset. This program would stress the national defense features of this particular commercial vessel.

It was interesting to listen to General Johnson's comments this morning about the ready reserve fleet. The one thing he failed to mention was the fact that, where would the people come from to man those 140 ships if they had to be broken out. It is much better to have an operating reserve than it is to have a reserve that is locked up some place in a river that has to be broken out, with all the attendant questions, such as whether or not those ships would be able to be operated and manned.

Our approach in this particular program, which we have identified in our statement, would essentially require or ask a U.S. operating company to put his own equity into the ship and to essentially apply to the Defense Department for those features on the ship that would be militarily useful. It would work very similar to the civilian aircraft reserve program that is currently operated between the commercial airlines and the Defense Department.

We think in this way you can, in fact, give to the trade negotiators the one thing they lack right now, and that is leverage in the negotiations. We gave away our program in 1981. We have no ability to discipline the marketplace in any fashion, unless we show them that we are serious about extending support to the shipbuilding and shipping industries of the United States.

And with those few brief comments, Senator Lott, I would be glad to respond to any questions you might have.

[The prepared statement of Mr. Stocker follows:]

STATEMENT OF

JOHN J. STOCKER
PRESIDENT
SHIPBUILDERS COUNCIL OF AMERICA

Mr. Chairman, Senator Cohen, and distinguished members of the Committee, I am John J. Stocker, President of the Shipbuilders Council of America. The Council is the national trade association representing the shipbuilding, ship repair, ship design and marine manufacturing industries in the United States. Our membership represents approximately 95 percent of all new construction and repair work in process in the country at this time. A list of our members is attached to this statement.

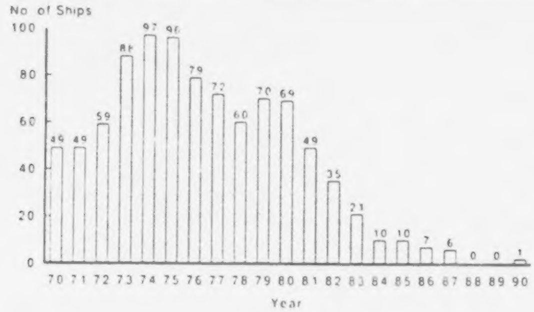
It is a pleasure for me to appear before you today to discuss the importance of a sealift program in providing needed military lift capability and in providing the industry with the means to transition itself away from its almost total reliance on government business to the commercial ship construction market.

Shipbuilding in the United States has had during the 1980s for all practical purposes, only one customer -- the U.S. Government, principally the U.S. Navy. Over 90 percent of our workload is derived from Navy contracts for new construction and repair.

This dependence on a single customer has largely occurred because of the collapse of the commercial shipbuilding market in the United States. In 1979, U.S. yards had 155 ships under construction, half of those orders were for commercial clients. Today, there is only one commercial ship on order in this country compared to almost 1700 internationally.

The following chart illustrates the precipitous decline of the commercial shipbuilding market in the United States:

NEW MERCHANT VESSELS UNDER CONSTRUCTION
OR ON ORDER AT U.S. PRIVATE SHIPYARDS
AS OF JANUARY 1, EACH YEAR



The reason for the collapse in commercial shipbuilding is due to foreign government subsidization of shipbuilding. In 1981, the Reagan Administration declared unilateral economic disarmament by terminating construction subsidies in the United States without declaring war on foreign subsidy practices.

In 1989, the Shipbuilders Council promulgated a Shipyard Recovery Program to attack unfair trade practices and to enable our industry's reemergence into the commercial market. This program has three principal and essential elements: the termination of foreign subsidies to provide an international competitive environment; the establishment of an immediate program to build commercially viable yet military useful ships to meet our nation's strategic sealift requirements; and a research and development program to pursue advanced ship designs and productivity improvements for the construction of those designs.

The United States Trade Representative (USTR) has been engaged for over a year in multilateral negotiations with the European Community and the Japanese and South Koreans to end the massive subsidies provided to their shipbuilding industries. The USTR was confident that an agreement could be reached by March 31 of this year, and set that date as its deadline.

Unfortunately, March has passed and no agreement is in sight. The major obstacle to reaching an agreement is the fact that the United States has no leverage. Our trading partners are unwilling to change their current practices for nothing in exchange.

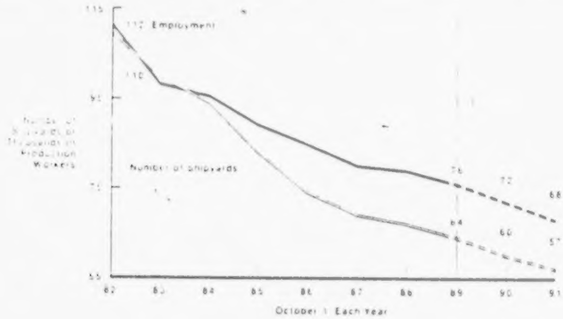
These negotiations must be successful, however, if U.S. yards are ever going to recapture a share of the commercial market. Your continued support of USTR's efforts in these negotiations would be appreciated.

The second part of the Recovery Program was the establishment of a sealift program. Last year, Congress appropriated $600 million for this purpose. The Secretary of Defense has thus far failed to execute the program, and has repeatedly recommended that the money be used as a funding source for other programs. In the recent Military Personnel reprogramming, the program's funding was reduced to $375 million.

I cannot emphasize enough how important this program is to our industry and to the nation. As defense dollars decline, the Navy's shipbuilding budget will be significantly restrained. Even during the 1980s when defense spending was at a peacetime high, the Navy could not sustain a shipyard base adequate to meet mobilization requirements. A little over a year ago, the Navy reported to Congress that the shipyard mobilization base could meet only 34 percent of its new construction requirements in time of mobilization. Since that report, three major shipyards have closed their gates.

In 1984, the Navy and the Maritime Administration did a Shipyard Mobilization Base Analysis (SYMBA) to determine which yards were essential to the nation in time of mobilization. As depicted in the following chart, 46 of those 110 SYMBA yards have closed and 36,000 direct production workers have been lost from the industry.

PRIVATE U.S. SHIPYARD BASE



As ships are cut from the Navy's budget, more shipyards will close. It is in the Department of Defense and the Nation's best interest that this industry survives during the downturn in defense expenditures if the shipyards are to exist to meet future national defense needs. The commercial market is our industry's future.

Construction of sealift ships will provide this industry with a bridge to that market. A transition program is essential in providing our yards with the opportunity to apply the tremendous gains they have achieved in production techniques and productivity improvements in the construction of naval ships to commercial ship construction. It will also provide us time to catch up with our foreign competitors who have benefitted substantially from the support of their governments over the last ten years. How can a country with only one ship on order be expected to compete overnight with a country like Japan that has over 400 commercial ships on order or under construction?

The sealift program should be structured to maximize the number of ships built in order to allow for greater shipyard participation.

To this end, the Council recommends that the program be managed by the Maritime Administration with NAVSEA oversight. Work performed to date by MARAD, the Navy, and the ship operating community has already produced several ship designs which will meet the requirements of the military and the commercial client engaged in foreign commerce. (Attached to this statement is a letter from Secretary of the Navy Larry Garrett dated April 20, 1990, recommending commercially viable ships with military capability.)

Under this approach, MARAD would work with the ship operator to ensure that the ship is commercially viable. NAVSEA would have oversight to ensure that the military features - such as speed, self-loading and off-loading capability, among others - are incorporated into the ships. The ship operator would then purchase the ship from the government for the cost of the ship's production minus the defense features. Or alternatively the ship operator would negotiate a construction contract with a shipyard and be reimbursed by the government for the cost of the defense features. The $375 million appropriated in the SCN account would pay for only those defense features incorporated above commercial requirements to meet the military's sealift missions.

The only way that the U.S. Government can ensure that the commercial fleet is suitable for its needs in time of emergency is to purchase the defense features. A commercial operator will not, and should not.

The program structured and managed accordingly would allow for the construction of as many as ten (10) ships using the initial $375 million, which would enable two shipyards to participate. It would provide each yard with the opportunity to build a series of ships based on one design. This would substantially reduce the ship's unit cost and provide the means for investment in facility improvements and worker training programs to further enhance productivity.

The third element of the Recovery Program is research and development of advanced ship designs and production technologies. I want to thank you, Mr. Chairman, for your leadership in recognizing this need and authorizing $15 million in FY'90 for research and development of alternative hull designs and propulsion technologies to produce a fast sealift ship of the future.

Unfortunately, $3.5 million of the $15 million has been lost in recent DoD reprogrammings. The Council supports funding the development of follow-on ship designs to provide increasingly enhanced military and commercial sealift capability. As General Colin Powell stated before this Committee last year: "All the airlift in the world won't sustain the lift requirement. We need sealift."

The shipbuilding industry has an opportunity today to become a force in the international market. We are fortunate that during a time when defense dollars are being cut, that the commercial shipbuilding market is experiencing a substantial upturn. The price of commercial ships built in Japan, South Korea, and elsewhere has more than doubled in the last two years due to this growing demand. In spite of foreign subsidies, the price differential between U.S. and internationally built commercial ships is narrowing rapidly.

Execution of the sealift program is essential if U.S. shipyards are to capture a share of the commercial market. If we do not share in this market, an adequate industry will not exist to meet future national requirements.

Thank you, Mr. Chairman. That concludes my prepared remarks.

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DEPARTMENT OF THE NAVY
OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20350-1000

20 April 1990

The Honorable Les Aspin
Chairman, Committee on Armed Services
House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

This report on fast sealift ship construction and technology development is submitted in accordance with the Conference Report to the National Defense Authorization Act for Fiscal Years 1990 and 1991 (House Report 101-331), and incorporates the information requested by the House Armed Services Committee on the same subjects in House Report 101-121.

In the naval recovery program of the past decade, we made significant investments, exceeding seven billion dollars, to improve our strategic sealift capability. This very successful sealift effort acquired eight fast sealift ships, 13 maritime prepositioning ships for three Marine Corps brigades, two hospital ships, nine auxiliary crane ships, two Marine Corps aviation logistics ships, five sealift tankers, and expanded the Ready Reserve Force to more than 90 ships. This comprehensive sealift program significantly improved our national strategic mobility posture, provided seagoing jobs to American mariners, and preserved a sector of the shipbuilding industrial base hard hit by lack of commercial shipbuilding.

We are now entering a new era of political, economic, and defense transition. In this era of transition there is one constant, which is that seaborne forces are very flexible in responding to events in a world characterized by great uncertainty. Our afloat forward deployed amphibious assault echelon Marine Corps units provide a rapid deployment force with great flexibility. Also, strategic sealift is a very cost effective way to reinforce our forward deployed units.

Expanding the concept of afloat prepositioning would increase strategic flexibility in conventional forces in scenarios from very short to long warning times; however, given rapidly evolving world events, we may not now need to continue to increase our dedicated military shipping for fast sealift.

In response to the Authorization Act, we established an interservice and interagency working group to guide technology development planning and determine characteristics for sealift ships.

Based on preliminary analysis, any near-term ship construction should acquire commercially viable ships capable of transporting and discharging military unit equipment. Unit equipment surge capability is the only component of strategic sealift mobility requirements where near-term projected capacities are below anticipated needs. Such ships could be roll-on/roll-off ships or combination roll-on roll-off/container ships.

There is no current shortfall of sealift tankers; in fact, available ships to carry petroleum products exceed current and projected near-term requirements. Accordingly, acquisition of sealift tankers either through new construction or by purchase of in-service commercial tankers will not be pursued at this time.

We are reviewing a range of ship design concepts and employment modes to determine which provides the greatest contribution to meeting defense sealift requirements at the lowest possible cost to the Government. This review includes the active participation of the maritime industry to balance their desired operating characteristics with military utility.

If I can be of any further assistance, please do not hesitate to contact me.

Sincerely,

H. Lawrence Garrett, III
Secretary of the Navy

cc:
The Honorable William L. Dickinson

Senator LOTT. Well, I want to thank you, Mr. Stocker, for appearing here on behalf of the Shipbuilders Council of America as its president. I do have a few questions I would like to ask you.

First of all, in your prepared statement on page 6 you express support for the sealift R&D program included in last year's budget. What do you think the priorities should be for this R&D program?

Mr. STOCKER. Well, I think, there are a number of areas that could be looked at. Let us not forget that if we are exchanging a world that has been fraught with national security tensions over the past 40 years, we are perhaps moving into a period where our real competition is going to come in the economic sphere.

Our friends in Japan are working on some very advanced cargo vessels for the future. And we ought to be looking at the same sort of thing that they are looking at, which is a high-speed vessel that is capable of responding to military needs and commercial demand.

Specifically, the things we would be looking at are improvements in seals for large scale surface effect ships. We ought to be testing the concept that has been discussed within the naval architecture community of a semi-planing cargo vessel that would include large scale pump jets. There ought to be an assessment of where the commercial market niches are for the U.S. industry.

Also, we have generated some real advances in our ability to produce naval vessels over the past 10 years. We ought to see if these advancements can assist the industry in making the transition from the Navy side of the market to the commercial side of the market.

There are elements of those production approaches which can be used in commercial ship construction. We think these would be useful ways of utilizing the R&D resources that this committee has supported in the past.

Senator Lott. You said you expect a boom in shipbuilding worldwide. Briefly, why is that? Because of the age of the fleet? Because of the new technology? Increasing demands? All of those?

Mr. Stocker. All of the above. But the primary reason is the replacement of aging vessels. The last major boom in shipbuilding worldwide was in the early 1970s largely driven by tanker construction requirements. Those ships are aging. The average age of the world fleet is approaching 15 years. That is very old by international standards. By comparison, Senator, the U.S. fleet is well over 20. So it is basically being driven by an age requirement.

The interesting thing, Senator Lott, is that the demand has already begun to start, and we are beginning to see situations where price levels are increasing; they are increasing dramatically. The cost of a very large crude carrier today is 50 percent higher than it was 12 months ago. And that is largely being driven by the tightening of supply in some countries, such as Japan, and the impact of the accelerating demand curve.

Senator Lott. Before I ask this next question, I think I should make note of an historic event that you are witnessing here today, where Senator Kennedy of Massachusetts turns the Chair over to Senator Lott of Mississippi. I am enjoying the heck out of it, I will tell you that. But in that connection, I have worked with Senator Kennedy on the fast sealift capability.

He has a particular angle that he likes to talk about, and that is, instead of it being commercial ships with defense capabilities, maybe it could be defense ships with commercial capabilities. Do you want to comment on that?

Mr. Stocker. Well, we could understand why he would be interested in that particular approach. Obviously, because of the fact that we are looking at this, at the centerpiece of this program being the defense side of it.

On the other hand, our concern about taking that particular approach really is reflected in the affordability aspects of it. We think stressing commercial viability with DOD oversight of the military utility of the ship and its design will generate what this committee is looking for and also will generate a greater number of ships.

Senator Lott. Well, your shipyard recovery program involves the Government paying for defense features of commercial ships.

Mr. Stocker. That is right.

Senator Lott. How would you allocate the cost on something like that, though?

Mr. Stocker. Well, there are a number of areas you would look at. For example, the speed requirement that DOD might be interested in is certainly greater than commercial practices would generally allow, and that is another point I need to stress.

General Johnson holds the mistaken view, I believe, that we will see a revitalization of the U.S. flag merchant marine absent a number of other factors in the marketplace. And that is largely driven by the fact that we have an industry that is bifurcated between very strong companies—there are a very small number of those—and a number of weaker companies.

The number of vessels those companies will be building over the next 10 years will not meet the sealift requirement. And those kinds of vessels that they will be building will be ships that will not be fast enough to meet even minimum defense requirements. So one of the areas that we would allocate defense cost to is an increase in requirements of, say, 17 knots to anywhere from 22 knots to 25 knots. And we would specifically look at propulsion plants and hull form as a way of trying to make decisions about allocation.

Senator LOTT. In your statement, also, you refer to the unfair trade practices of foreign countries in supporting their shipyards with massive subsidies. You have talked about that in your informal statement. You filed a petition with the U.S. Trade Representative last year against these countries; now you sound pessimistic about the prospects for negotiated settlement, if you will. So what is the status of your petition?

Mr. STOCKER. Well, the petition still is in abeyance; although I have to tell you that we are currently reviewing our options. We will know a lot more once the negotiating team returns from Paris. But we are very concerned that the negotiating team has run into a brick wall, largely because of the reason I mentioned earlier, which is the fact that we have no leverage since we made a decision to unilaterally terminate our programs back in 1981.

And I think this kind of a program, which has a strong national security element in it, would still be seen by the other side as indicating a strong willingness on the part of the U.S. Government to back an industry that, frankly, other countries would just as soon see go away.

Senator LOTT. All right. You talked about what the markets will be for civilian shipbuilding in America in the near future, and you are pessimistic about it, unless some things are done. What are you referring to?

Are you talking about some sort of agreement involving what your petition was filed on, trying to determine subsidies? Or are you talking about cargo preference? What are two or three of the things that are essential for us to rebuild our civilian shipbuilding capability in the country at a time when the numbers of military ships we are building will probably be declining?

Mr. STOCKER. There are a number of elements that we would look at. For example, we think the Congress ought to seriously think about the possibility of writing statutory provisions that would impose sanctions on countries that refuse to settle with us on the subsidy issue.

Since most of these countries view the United States as a major economy with which they want to trade, the threat of sanctions would be seen by these countries as a real incentive to end their subsidies. Sanctions would provide them with the incentive to discipline the marketplace.

Senator LOTT. Well, now, let me ask you, are you asking us to do something that you could do under your petition?

Mr. STOCKER. Well, we could, except the only problem with that, Senator, is that we have allowed this negotiating process to go on now for over a year. And the real question is, if we wait much longer, will we in fact miss the upturn in the market. We are very concerned about that.

And while we have been as fully supportive of the trade negotiating team as we possibly can, there is a limit to how much we can do in terms of waiting. If we wait long enough, the market will disappear before the other side reaches an agreement with us.

In addition to sanctions, the sealift program should be 3-year program which will serve as an important transition effort for those yards interested in moving away from total dependence on Navy contracts to meeting the commercial market demand. This is a necessary element of our recovery program.

Again, we have talked about the possibility of cargo preference programs in the past, perhaps ones that are oriented toward imports and that would be more punitive toward those countries who refuse to eradicate their subsidies would be a good approach. We should also look at ways through our tax system, to encourage U.S. building and U.S. ownership.

And some of these issues we will be discussing with you in the next three or four weeks, as we begin our response to the lack of progress that has been made in the negotiating sessions that have gone on over the past year.

Senator LOTT. I have made the comment several times and again today that I have been hearing talk along these lines for 20 years, ever since I have been in Congress, and we have continued to lose ground. I have wondered why we have not been able to get our attention focused and go forward in a coordinated way, and there are a lot of explanations.

Congress has not been willing to do what it could do, including cargo preference. Administrations have not been willing to spend the money that was called for, even though in the early 1970s we had a specific plan that was going to rebuild our merchant marine. I also think the industry has not always been in agreement or very focused. I think that the time is getting to a point of being very crucial, and that we are facing an impending disaster here. If we cannot get the Congress and the Administration and the industry together on something, we are going to be, as you say, left out.

Mr. STOCKER. Senator, we recognize that, and we agree with you wholeheartedly. That is one of the reasons why we have attempted to take very firm steps within our own industry to advance the level of awareness of the conditions we have to operate under in the international market.

We need a rectification of those conditions. And while I have seen a significant amount of activity on the part of the administration to try to do something about the subsidy practices of others, they have not taken that next crucial step, which is, what do we do to ensure that we will continue to have a robust shipbuilding industry into the future, exactly what General Johnson referred to this morning.

If he wants to predicate a sealift policy based on a robust commercial industry, then he had better work with us, with the industry, and with the Congress to ensure that that robust commercial industry is there 10 years from now.

Senator LOTT. Well, thank you very much for your testimony. I believe the other senators will not return. We do appreciate your appearance and we look forward to working with you on this issue in the months ahead.

Thank you very much.

Mr. **Stocker**. Thank you, Senator Lott.

Senator **Lott**. This hearing is concluded.

[Questions for the record with answers supplied follow:]

Questions Submitted by Senator Edward M. Kennedy

NEW LIFT REQUIREMENTS

Senator **Kennedy**. Mr. Berteau, on page 1 of your prepared statement, you mention the fact that the Department of Defense has completed initial assessments of new lift requirements. For a number of years, we have been operating under assumptions and requirements contained in the Congressionally Mandated Mobility Study (CMMS). What can you tell us about the new lift requirements and the general scenarios upon which they are based?

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

AVAILABILITY OF BETTER ESTIMATES OF REQUIREMENTS

Senator **Kennedy**. Mr. Berteau, also on page 1 of your statement, in mentioning your assessments of airlift and sealift requirements, you leave the impression that they are somewhat tentative. When could the Congress expect to see any results of your review of lift requirements that are more definitive?

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

RELATIVE EMPHASIS ON AIRLIFT AND SEALIFT

Senator **Kennedy**. Does Secretary Cheney's decision from the Major Aircraft Review (MAR) to cut the C-17 program from 210 to 120 aircraft reflect a general shift in emphasis from airlift to sealift or a reduction in overall lift requirements?

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

EMPHASIS ON SEALIFT/FAST SEALIFT

Senator **Kennedy**. Does the increase in warning times lead to a relatively greater emphasis on sealift? Is there still a need for fast sealift, particularly since our forces in Europe will be greatly reduced over current levels?

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

USE OF FISCAL YEAR 1990 SEALIFT PROCUREMENT FUNDS

Senator **Kennedy**. I would be interested in how the Department intends to use the sealift procurement funds appropriated in fiscal year 1990. It would seem to me that the country would get more ships and capability out of commercial ships built with some military utility, rather than ships of military design built to include some commercial features. Do you agree? Shouldn't the fiscal year 1990 funds be directed toward such an end?

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

SEALIFT POLICY IMPLEMENTATION SCHEDULE

Senator **Kennedy**. What is the schedule for the Sealift's Policy Coordinating Committee to produce any recommendations upon which the Congress could act?

(Mr. Berteau failed to provide the requested information in a timely fashion. The information will be retained in committee files.)

OTHER WEAK LINKS IN THE LIFT EQUATION

Senator **Kennedy**. General Johnson, last year's report on fast sealift alternatives pointed out that there was a nontrivial problem of getting Army forces marshaled at ports and that the timeliness of delivery of forces to Europe is heavily dependent upon this portion of the trip. What alternatives is USTRANSCOM exploring to improve the Army's ability to get to the ports?

General JOHNSON. Although USFORSCOM is the primary agent charged with the movement of Army forces to ports of embarkation, USTRANSCOM has a supporting role in this issue. Together, we are pursuing several initiatives to overcome delays.

Through our deliberate planning process, we test the outloading capability of each installation with a mobilization mission against the requirements stated in the warplans. Any shortfalls are reported, along with suggestions for correction. The service provider, in this case, the Army, is responsible for implementing required changes. In addition, shortfalls influence the priority for Army allocation of funds for rail upgrade and initiate studies by the Transportation Engineering Agency which develops recommendations for more effective methods of outloading, such as use of nearby commercial facilities or building of temporary ramps.

Although we own a limited number of heavy duty railcars, the majority of unit equipment will be moved by the commercial transportation industry. In July 1989, we completed a Joint Chiefs of Staff-directed Mobilization and Deployment Movements Study which concluded that, overall, the commercial industry could support the total DOD requirement. However, it did anticipate regional and spot shortages of specific types of transportation assets. We are currently involved in a detailed survey to determine where those spot shortages might occur, and how we can fix them before they become a problem.

Another factor in getting units to port is the speed with which they can execute their deployment orders. Since this is heavily dependent on preplanning, our Unit Deployment Analysis program was developed to analyze the deployment plan for a unit. This provides for a mutual understanding of the deployment process and promotes the exchange of information between planners and warfighting units. The net result is to improve the process by better educating all parties, and by incorporating lessons learned to make plans more efficient and effective at execution.

In addition to these initiatives, which expedite movement to the port of embarkation, USTRANSCOM is actively pursuing ways to improve the closure of the unit to their ports of debarkation. These include the consolidation and channelization of cargo to make optimum use of available shipping and the increased use of containerization, reflecting a trend in commercial industry.

We have also been an active participant in the "Improving Force Closures for Europe" working group. The charter for this group will expire on 1 October 1990 with a recommendation for rechartering under the general title of "Improving Force Closure," and to continue to explore ways of improving the time needed to deploy forces to any theater. The current orientation toward Europe will remain a part of the focus within the overall orientation.

LIFT—NATIONAL OR DEFENSE PROBLEM?

Senator KENNEDY. General Johnson, on page 12 of your prepared statement, you state that the "continued erosion of our U.S.-flagged sealift capability is clearly a national problem, which requires a national solution." The National Sealift Policy, signed last October by President Bush, states that "New programs to enhance our ability to meet national security sealift requirements shall compete for resources with other national security programs." How can we reconcile these two, apparently differing views?

General JOHNSON. In actuality, these views do not conflict, but reiterate the need to improve our sealift capability as a Nation. Both my statement and the one you cite in the National Security Sealift Policy culminate at least 2 years of intensive effort by my predecessor to provide focus to military sealift issues. My concern for the strength of U.S. flagged sealift is not diminished because it must compete with other national priorities. The National Security Sealift Policy sets the stage for ensuring all national security sealift needs, including military, are given a fair and objective priority.

C-17

Senator KENNEDY. General Croker, the Congress has been anxiously awaiting the Air Force's producing a revised schedule for the C-17 which reflects the decisions made by Secretary Cheney as a part of the Major Aircraft Review (MAR). During the hearing, you provided aggregate cost data comparisons for the C-17 program before and after the results of the MAR. When can we expect to see revised detailed assembly schedules and revised budget justification schedules? What has taken so long to make these revisions?

General **Croker**. The Major Aircraft Review (MAR) process culminated with SECDEF's announcement of his decision on 26 April. He told Congress that the services would be afforded the opportunity to examine the funding numbers associated with his prescribed profiles. Since his announcement, the Air Force scrubbed the SECDEF's MAR numbers and has recently reconciled the differences.

The Air Force realized that the SECDEF MAR profile could not be executed for the dollars assigned. Therefore, the Air Force presented an alternative (Air Force Recommended) profile to OSD. This profile delivers the SECDEF announced fiscal year 1991 savings and renders a less severe impact on the Douglas Aircraft Company (DAC) work force. The Air Force Recommended program has been briefed through DEPSECDEF, and recently it has been approved to be discussed with Congress as the revised C-17 program. The Air Force has shared (with SASC and HASC staffers) the details of the new program's fiscal year 1991 budget data and the acquisition strategy of combining the fiscal year 1991 buys to minimize disruption of the DAC work force. The Air Force revisions and subsequent reconciliation of the C-17 program has taken some time; however, the results of these deliberations were provided as soon as they were available to the appropriate congressional staffers. The Air Force Recommended program is shown below:

FY89/P	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	TOTAL
($B)										
5.10	2.35	1.68	3.34	3.85	3.40	3.46	3.29	3.30	2.57	32.34
QUANTITY/(DELIVERED)										
6	4	2	9	15	15	18	18	18	15	120
(0)	(0)	(1)	(7)	(5)	(9)	(15)	(17)	(18)	(18)	

Senator **Kennedy**. As I understand the testimony this morning, the fiscal year 1990 production funds will not be awarded until 3 months into the fiscal year 1991 production period. Further, delaying fiscal year 1991 production funds until fiscal year 1992 would support awarding the next contract in October, 1991, rather than along the current schedule of awarding it in September, 1991. This would appear to result in at most a 1 month slip in the program, presuming that fabrication and first flight of the first two aircraft do not slip further of their own accord. Of course, if there were any further slips in these milestones, award of any fiscal year production funds could slip into fiscal year 1992 anyway.

General Croker, why wouldn't this be a more sensible approach, given all the problems that are being experienced at the contractor's plant? What would be the impact of slipping contract award 1 month?

General **Croker**. No, this would not be a more sensible approach. It is true that Douglas has experienced some problems at their plant. However, since last November, when the program was re-baselined, DAC has met every inchstone they have been required to meet. A new, more aggressive management team was installed at DAC this summer and the impact of this team's leadership is already beginning to show positively in the area of their Total Quality Management system. It is a misunderstanding that slipping contract award 1 month into fiscal year 1992 would result in only a 1 month slip in the program. The fact that T-1 assembly is 10 months behind schedule does not automatically mean that the rest of the aircraft fabrication and assembly is also 10 months behind. DAC has been using long lead funding to fabricate the four fiscal year 1990 aircraft. Each one of these four aircraft are at different stages of fabrication. The basic concept of the event based contract is that the contractor will not be paid in full until the prescribed event is performed or completed. He is required to protect the delivery schedule at his own risk and is incentivized to catch up to the schedule, if behind, in order to reap the benefits of his efforts once the event is completed. If the fiscal year 1991 contract were to be slipped into the next fiscal year, and no aircraft are authorized in fiscal year 1991, the net result will be devastating to the DAC work force, and there will be a 10 month to 1 year gap in production in the program. SECDEF's MAR decision to reduce the fiscal year 1991 buy to 2 aircraft results in major impacts to the DAC work force (70-75 percent reduction). The Air Force Recommended profile, which is designed to still meet SECDEF's advertised fiscal year 1991 savings, yet minimize the impact on the DAC work force, reduces the work force by only 40-45 percent. However, if no aircraft are authorized in fiscal year 1991, practically all of the DAC C-17 work force will disappear. This is because the fabricators and system installers will get to the point where they run out of aircraft to work on and would be laid off.

After the gap in production, the government will face start up costs, and DAC must rehire new people to replace those laid off. Unfortunately, when the experienced workers were laid off, they took the accumulated learning with them. Therefore, by gapping the program for a year, we start at the bottom end of the learning curve all over again. A proposed slip of the award of fiscal year 1991 funds into fiscal year 1992 is certainly not the most sensible approach. The most prudent, least costly, and least harmful to DAC's work force learning and efficiency is for the Congress to authorize 2 aircraft in fiscal year 1991 and its required funding, and for the combined fiscal year 1990-91 Air Force Recommended profile to be initiated.

[Whereupon, at 12 o'clock noon, the hearing was adjourned.]

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